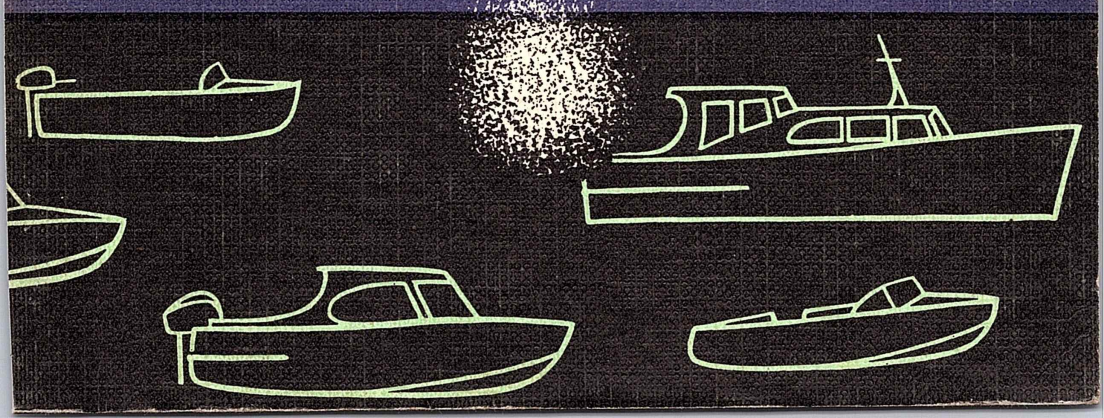
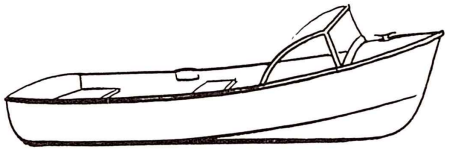
safety in small craft



SAFETY IN SMALL CRAFT

published in conjunction with the Marine Department



1968

A. R. SHEARER, GOVERNMENT PRINTER, WELLINGTON, NEW ZEALAND

Sig. 1*

CREDIT

Various portions of this book have been based upon publications by the Coastguard of the United States of America. The Marine Department wishes to place on record its thanks to the United States Coastguard for complete and generous cooperation.

CAUTION

Frequently during this book references and extracts have been made from New Zealand Government regulations. For the sake of clarity in some parts omissions have been made and phrasing simplified so that the reader may easily understand some of his obligations. Please do not assume that this book covers every aspect of the law; you should use the regulations themselves for reference.

Material from this booklet may be reproduced providing due acknowledgment is made to the publisher.

First published October 1962
Reprinted November 1962
Reprinted July 1968

Set by "Monophoto" in Times Roman and printed Offset

FOREWORD

This booklet has been compiled by officers of the Marine Department with the help and ideas received from boating clubs and the United States Coastguard.

It covers all the main aspects of boating and can serve as a basic manual for the pleasure boatman. The contents are non technical and as far as possible layman's language has been used throughout.

The booklet contains information on the requirements of boating regulations including the recent changes to the International Steering and Sailing rules, better known as the Rule of the Road at Sea.

I trust that in some way the information contained in this booklet will assist in promoting safe boating practices and ensure that all who use our waters are able to do so in complete safety and harmony.

I would enjoin you all to "play it safe" when out boating.

MINISTER OF MARINE

CONTENTS

	PAGE
Introduction	5
You are Responsible	7
Boats Generally	7
What Equipment to Carry	10
Points to Remember	13
Weather	19
The Motor Launch Regulations	20
Rule of the Road	25
Boat Handling	30
Boatmanship	36
Anchors and Anchoring	45
Water Skiing and Canoeing	51
A Lighthouse Keeper's Report	53
Fog Signals	54
Lights to Show (see also page 70)	58
Flags (see also page 67)	59
Aids to Navigation (see also pages 68–69)	60
Electronic Aids to Navigation	62
Mechanical and Safety Tips	63
Emergencies (Fire, Etc.)	71
Search and Rescue	82
Distress Signals	87
Abandoning Ship	87
Marine Department Notices	88
Clothing	89
Sea Fishing	90
Long Voyages	93
Nautical Miles and Statute Miles	97
Charts, Tides and Publications	98
Certificates and Licences	102
Keep New Zealand Green	109
Rescue Breathing	110
Appendix I – Lights and Daymarks of Vessels	111
Appendix II – The Collision Regulations Order 1965	120

INTRODUCTION

Would you go up in the air with an inexperienced person piloting an aeroplane? Would you venture out in a friend's new car if you knew he could not drive? Of course not, yet many people go out in boats with inexperienced owner-skippers who know that the water is wet and that's about all.

When you *pay a fare* for a boat trip in New Zealand waters you can be reasonably certain that every possible precaution is being taken by the master of the craft because the Marine Department has satisfied itself *on your behalf* that the boat is sound and carries safety equipment and the skipper is experienced and has been examined.

But there are hundreds of small craft plying in harbours, rivers, and lakes of this country – some going many miles from the shoreline – with proud owner-skippers who haven't a clue about what to do in an emergency. A number of these craft have been built in backyards with the help of friends – they float all right, but how well can they stand up to the uncalculated peril?

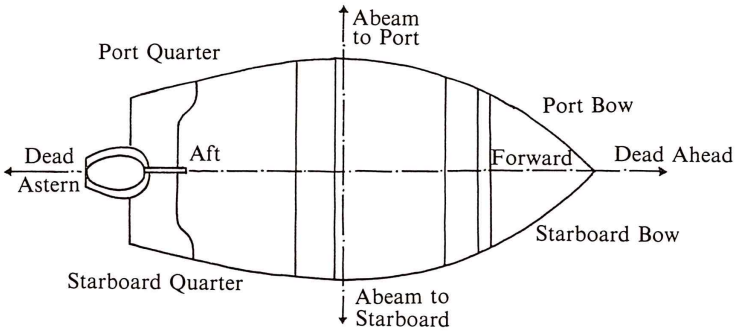
The yacht owner, who is generally an enthusiast, joins friends and forms a club of some sort. Responsible rules are made and club officials see that these are carried out. The Marine Department endorses this type of organisation and sometimes wishes that *all* boat owners were in one big club and always under the eyes of some responsible person.

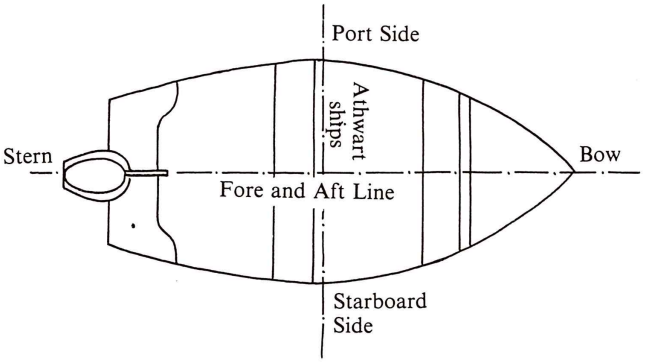
We know of course that this cannot happen. Independence is the New Zealander's strongest trait and most times he or she wants to be off on the lonely waters miles from anywhere or anybody. This booklet recognises that fact and is for everyone who goes down to the sea (or lake) in ships, boats, or catamarans – the canoeist, rowing boat enthusiast, yachtsman, power-boat fan, and launch owner.

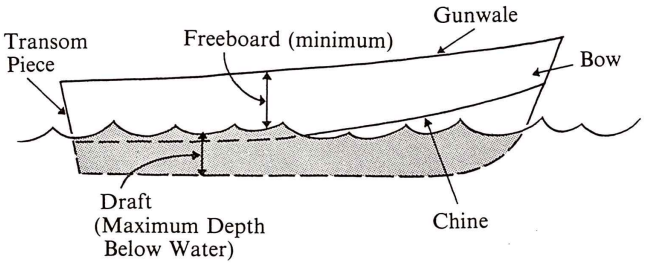
The information is based on the experiences of hundreds of people – those that could tell about it afterwards and those who could not.

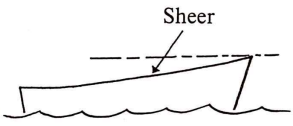
Play your chosen recreation or sport safely. You won't find good seamen or boatmen saying "I've been in boats for 15 years, man and boy. There's not much you can tell me. We can make it across to the island today easily. Bring the extra kids."

DESCRIPTION OF TERMS

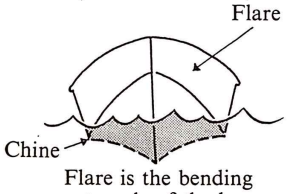








Sheer is the rise of the Bow of a boat from the horizontal.



Flare is the bending outwards of the bow.

YOU ARE RESPONSIBLE

The tremendous increase in popularity which pleasure boating has enjoyed in this country in the last few years has created a host of new problems relating to its regulation and safety. Many people lose their lives each year because of their own or someone else's ignorance or carelessness.

The Marine Department wants to reach all new boat owners (and some not so new boat owners) with information which can make their newly adopted sport safe for themselves and others.

BOATS GENERALLY

TYPES OF CRAFT

A designer has yet to build a boat which will satisfy all requirements. Therefore the prospective buyer or builder should decide carefully what general use his boat is going to have.

For example, a boat that is to be used for fishing or hunting **must** be stable and ruggedly built. Both these activities require a certain amount of standing and moving about in the boat. This means a beamy boat with high sides. It should also be sturdy enough to take the punishment of frequent groundings on rocky shores. In protected waters a skiff or similar flat-bottomed, wide-beamed, shallow draft hull 10–18 ft long is satisfactory.

A boat for cruising or used as a family pleasure boat for picnicking, swimming parties, etc., depends on the size of the family and their tastes, and the waters on which the boat will be used. On protected waters

("protected" means small lakes less than 1 mile across, rivers, except at the mouth, and sounds of small extent), an open boat will be suitable. It can range from an 8 ft punt to a 48 ft launch, depending upon your requirements and finances.

If you are cruising on semi-protected waters, such as large lakes, bays, or sounds, an open boat is not recommended, for in these waters a heavy chop can develop rapidly and you may find yourself in the critical situation of being a mile or more from shore, taking water over the side and having to bail like mad to keep afloat. Only a boat which is completely decked over or provided with sufficient internal buoyancy to remain afloat if it is flooded should be used on such waters. The hull design should provide for a V-bottom or rounded bottom hull rather than a flat-bottomed hull, this helps to avoid waves coming aboard.

OVERCROWDING

Of course, one sure way to have water coming aboard is to load up with so many people that the sides of your boat are almost immersed.

If you've a trip ahead with a lot of people, make a check this way. Find the volume by multiplying the product of the length breadth and depth by 0·6. This factor 0·6 is an approximate ratio of the shape of the boat to a box of the same dimensions. For each cubic foot of volume allow a load of 12 pounds weight. This load includes passengers and crew, engine and all other gear aboard. Do not exceed this total load. The second check is to ensure that the boat has adequate stability with all persons and gear on board, and can be ascertained as follows:

Measure the freeboard (distance between the water's surface and the gunwale or deck of the boat) with all the fuel, water, and other gear aboard and the persons to be carried, or their equivalent weight distributed evenly about the centre line. Mark the hull at the low point of sheer (that's the part which is nearest the water's surface) at a point equal to half the freeboard. Now have half the people from each side of the centre line shift their position to the gunwale on the side on which the half-freeboard mark was placed. If this mark is not submerged by this shift in weight, the boat has adequate stability for the number of persons aboard; if it is submerged, you have too many people aboard – either put some ashore or buy a bigger boat. This test applies to a decked-in craft – open boats must show a much higher freeboard when the weight is shifted on account of danger of shipping water which affects both freeboard and stability.

MATERIALS

In recent years the tendency has been for plastics and fibre glass to be used much more frequently for building boats. These materials have

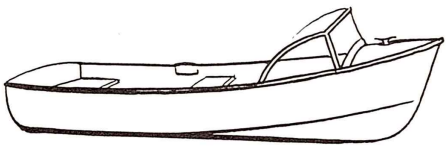
the advantage of being extremely resistant to all the various forms of deterioration which attack a boat and they can be made fire-resistant. Most boats of this type are constructed of several plies of a glass cloth, mat, or woven material impregnated with a resin. This results in a fairly heavy boat which needs a buoyancy tank built into it or some buoyant materials attached so that it will float when overturned.

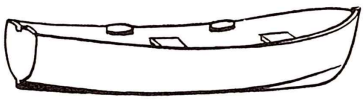
Plywood boats are easily constructed. You should be careful when selecting or building a plywood boat that only top grade marine plywood is used and that fittings are made of bronze, brass, or stainless steel.

Plywood boats should also be fitted with buoyancy tanks or material so that the boat will float when full of water and support the occupants.

On small boats with smooth skins such as fibre glass it's a good idea to put a grab line round the boat fixed to the sides. If the boat capsizes, there is something to give a handhold.

Larger cruising boats with sleeping accommodation are built with ribs, keel planking, and decking of suitable strong timbers, caulked and painted. Experience is the only guide with this type of craft – employ a recognised surveyor to examine it before you buy. This could save money and perhaps your life in the long run. Watch out for so-called bargains.





MAINTENANCE

Make sure that your boat is seaworthy. Spend time in the off season maintaining the boat and its gear in sound condition. Check the hull and deal with any leaks.

Painted surfaces may cover a multitude of sins – make certain that underneath the paint there is no deterioration of materials.

Have the engine serviced on a regular schedule. It will help you if you keep a log of hours run and any maintenance work done.

Pay particular attention to stanchions and grab lines and their connections. See also that your lifesaving and fire-fighting equipment is checked regularly.

WHAT EQUIPMENT TO CARRY

All boats should carry sufficient equipment to ensure minimum safety standards are met. The wise boat owner sees his craft is equipped to meet the maximum safety standards.

In any waters in which a craft is being used for pleasure purposes it should have on board the following items, **at least:**

1. A secondary method of propulsion such as spare oars for a small boat, or a spare outboard engine for a power launch, or sails.
2. Fire-fighting equipment.
3. A bailing device. This could be a bucket or a pump.
4. A lifejacket for each person in the boat kept within easy reach.
5. A spare plug for the draining hole (if fitted).

In Any Case

Children and non-swimmers should wear life jackets all the time when in small boats.

DO remember that neglect to carry suitable equipment may put your boat and, perhaps, your life in danger.

It is impossible to make standards for each type of boat in various waters, e.g., sounds or open sea. However, if we take three fairly distinct areas of water having different danger factors, an indication of the sort of equipment to carry can be given.

OPEN WATERS

The open sea, large bays, harbours, and sounds, large lakes or lakes with a long reach of water.

SEMI-PROTECTED WATERS

Moderate-sized bays, lakes, harbours, and narrow sounds.

PROTECTED WATERS

Small lakes (less than 1 mile across), rivers (except at the mouth), small enclosed bays, sounds where the shore is never more than half a mile away, and small harbours.

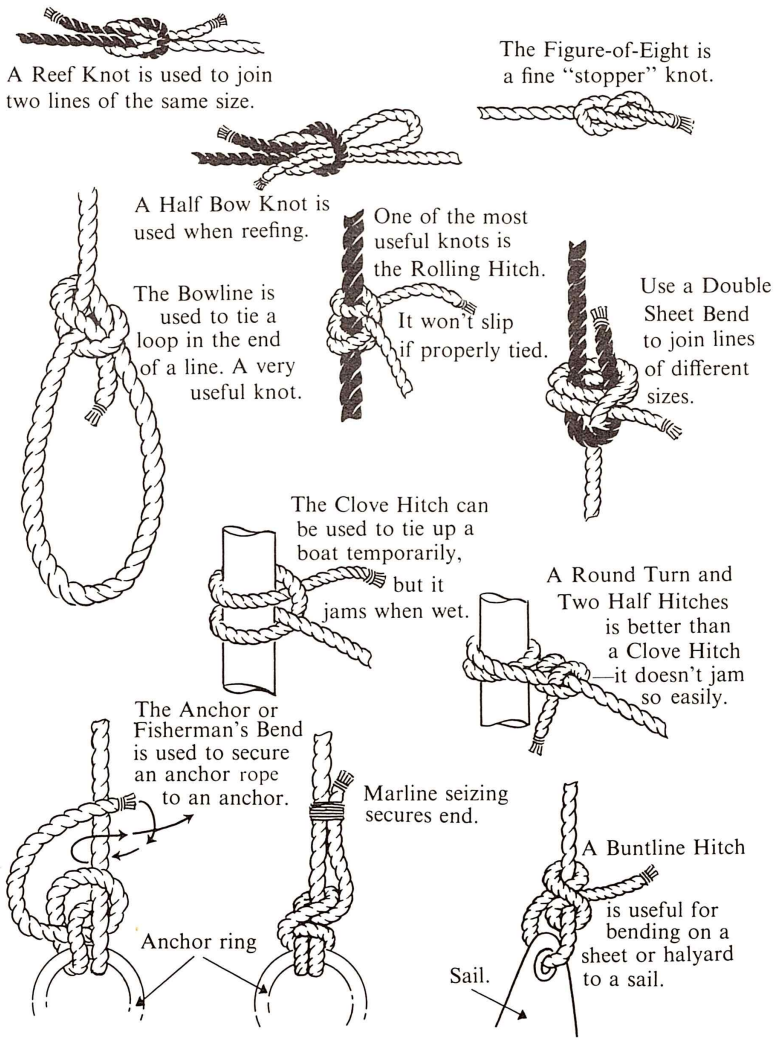
The following table is a guide to the equipment to carry on board. This will vary according to type of boat:

N = **NECESSARY** for safety
R = **RECOMMENDED** for Additional Safety
D = **DESIRABLE** for Efficiency

Items	Length of Boat								
	Up to 16 Ft			16–26 Ft			26–40 Ft		
	Open Waters	Semi-Protected Waters	Protected Waters	Open Waters	Semi-Protected Waters	Protected Waters	Open Waters	Semi-Protected Waters	Protected Waters
Anchor(s)	N	N	N	N	N	N	N	N	N
Boat hook	D	D	D	D	D	D	N	R	R
Bucket or bailer, pump, etc.	N	N	N	N	N	N	N	N	N
Compass	N	R	..	N	R	..	N	R	D
Distress or smoke flares	N	R	..	N	R	D	N	R	D
Fire extinguisher	N	N	N	N	N	N	N	N	N
First aid kit	R	R	R	N	R	R	N	R	R
Flashlight	N	R	R	N	R	R	N	R	R
Life jackets or buoyant vests	N	N	N	N	N	N	N	N	N
Lifebuoy(s)	D	D	..	N	N	R	N	N	N
Local charts	N	D	..	N	N	R	N	N	R
Mooring lines and spare rope	D	D	D	N	R	R	N	R	R
Oars or paddles, or outboard motor	N*	N*	N*	N*	N*	N*	N*	N*	N*
Radiotelephone	R	D	..	N	D	..	N	R	..
Sounding pole or lead line	D	D	..	R	R	D	N	N	R
Spare engine parts	N	R	..	N†	N†	D	N†	N †	D
Tools	N	R	D	N†	N†	D	N†	N†	D

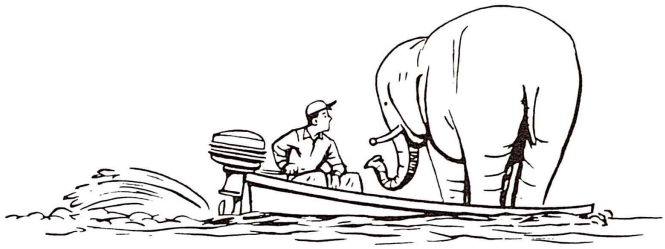
*Except twin-engined craft – substitute "R".
†With outboard engines – substitute "R".

YACHTSMAN'S KNOTS


A Reef Knot is used to join two lines of the same size.
The Figure-of-Eight is a fine "stopper" knot.
A Half Bow Knot is used when reefing.
One of the most useful knots is the Rolling Hitch.
It won't slip if properly tied.
The Bowline is used to tie a loop in the end of a line. A very useful knot.
Use a Double Sheet Bend to join lines of different sizes.
The Clove Hitch can be used to tie up a boat temporarily, but it jams when wet.
A Round Turn and Two Half Hitches is better than a Clove Hitch—it doesn't jam so easily.
The Anchor or Fisherman's Bend is used to secure an anchor rope to an anchor.
Marline seizing secures end.
Anchor ring
A Buntline Hitch is useful for bending on a sheet or halyard to a sail.
Sail.

POINTS TO REMEMBER

1. **Do not overload your boat.** Overloading, with consequent loss of stability and seaworthiness, is one of the greatest factors causing deaths in boating accidents.



2. **Do not leave shore in a leaky or poorly constructed boat.** There is nowhere you can get out and walk if your boat begins to break up or ships water through opening bottom seams.

3. **Drinking and safe boating do not mix.** As with driving a car, drinking distorts your judgment of speed, distance, and reflex action. In addition, it dulls your memory of the characteristic features of any area of water and the dangers it may contain.

4. **Observe the collision rules.** Just as there are traffic laws for roads, there are also rules designed to regulate and facilitate the movement of ships, yachts, and small boats. The international rules are contained in this booklet, but you should make inquiries about local rules as well.

5. **Make sure at least one of your passengers or crew knows how to handle the boat and try and make everyone familiar with the use of emergency equipment.** In larger boats everyone will be in a much better position to survive a fire if each one knows how to use fire extinguishers and life jackets.

6. **Don't hurry when equipping or supplying your boat.** An item forgotten in haste to get underway can become a major hazard by its absence in time of emergency. A fire extinguisher, readily available ashore, cannot be picked up at sea. Above all, be sure to see that you have sufficient fuel to allow for unforeseen difficulties.

7. **Obtain local information of the area in which you use your boat.** You may find yourself in trouble due to shoals, reefs and breaking seas, or in an area reserved for gunfire unless you gain adequate knowledge of the place.

8. **Have lifejackets readily available. Have children wear them all the time in a small boat.** A great many cases have arisen where the wearing of a lifejacket would have saved lives.

9. **Check the weather and tides before you go out and have due regard for them.** Weather is variable and subject to change in a brief period of time. A fine day in the morning can turn to a cold, strong wind by the afternoon. A calm sea can rise quickly to the point where it is dangerous for you to sail into it. An ebb tide can carry you out quicker than you can move against the current. "Keep your weather eye open."

10. **Have an adequate fuel filter.** Keep your fuel free from foreign particles and substances. Dependable engines rely upon a continuous fuel supply. A stopped fuel line can mean a stopped boat. Keep fuel tanks free from sludge.

11. **Check your battery and its ventilation.** A strong battery is necessary to ensure that you can restart your engine if it has been stopped for any reason. Proper ventilation of the battery is required to disperse dangerous fumes.

12. **Do not go close to swimmers in the water.** It is difficult to spot a human head on the surface of the water, even more so when the boat is speeding and "bobbing". In any case it's against the law to speed near swimmers. A touch of your boat or its screw on a swimmer is enough to cause extensive, if not fatal injuries to the person in the water. (See the Motor Launch Regulations.)

13. **Do not forget your wake can damage others.** Long after your boat has passed any point, your wake will continue to roll. Looking ahead you may see nothing but smooth water. Astern, however, good-sized waves may have formed which, like those formed from natural causes, can smash boats against their moorings and damage property on the shore.

14. **Do not fail to reduce speed through anchorage areas.** Not only can you snap moorings by speeding among anchored boats, but your visibility is restricted and a serious collision may result if suddenly another boat appears from behind an anchored one. If it is near a meal time you will be cursed roundly by the cooks on the anchored boats. (See the Motor Launch Regulations on page 20.)

15. **Do not be afraid of a boat – respect it.** While there are dangers in the operation of a boat just as there are with a car, they can be kept at bay with the exercise of plain common sense. Know the hazards and know how to overcome them. *Think ahead* about what you might do in an emergency.

This booklet contains advice on the above and other points, given in a more detailed manner.

LIFE JACKETS

These are important and may save your life. Choose a strong type that will stand up to wear, and one that bears the stamp of the New Zealand Standards Institute.

(1) If it is kapok-filled (kapok is a water-resistant fibre and very light) keep it dry. If left in a damp place the kapok eventually loses its excellent flotation qualities and becomes unsafe. Do not use them as cushions – this compresses the fibres and reduces their efficiency. The kapok should be enclosed in some oil-tight inner covering.

(2) If it is plastic, keep it clear of snags and nails. See it has as many airtight sections as possible.

(3) Choose some type which will keep the wearer's head and mouth clear of the water should he be unconscious. This requires neck support and, also, support of the chest to keep the face up.

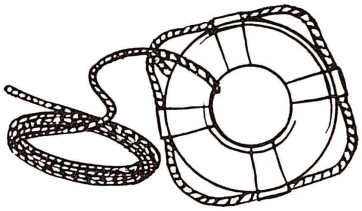
(4) Types inflated by means of compressed air are satisfactory only with proper maintenance and extreme care in handling. They should not be used where a long immersion is possible.

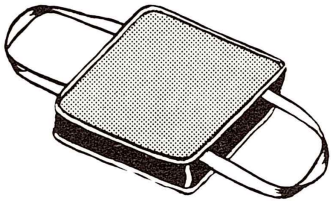
(5) Children and non-swimmers should wear life jackets at all times, and the others must keep them readily available.

(6) An idea is to attach a mouth whistle to them. This is a good means of attracting attention to a person in the water.

LIFEBUOYS

These should contain granulated cork, onazote, fibre glass preparation, or something similar, be in good condition, and painted red and white or some other bright colours. A light rope around them makes them easier to throw and is something for the person in the water to cling to.



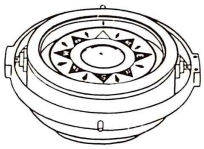


BUOYANT CUSHIONS

These are handy pieces of life-saving equipment and should not be maltreated.

BUOYANT VESTS

These are an *aid* to keeping afloat. They should not be confused with a "life" jacket which takes over the complete function of support, leaving the head free of the water's surface. Keep them in good condition.



THE COMPASS

For the boat using open water a compass is necessary equipment. It should be placed where it can be easily read by the person steering, but not near any electrical equipment or steel objects. It should be securely fastened, whether temporary or permanent, and given some sort of lighting for night use.

No matter how careful you are the compass will always be affected by metal parts of the boat's structure and will never or rarely be magnetically true in direction. In areas where a boat is used frequently it is

a good idea to note compass courses in good visibility. In this way you will know what compass courses are necessary during periods of low visibility or at night.

Never place a transistor, or a portable radio or a camera-light meter near the compass, even when it's not being used. You will affect the compass by doing so.

FLASHLIGHT

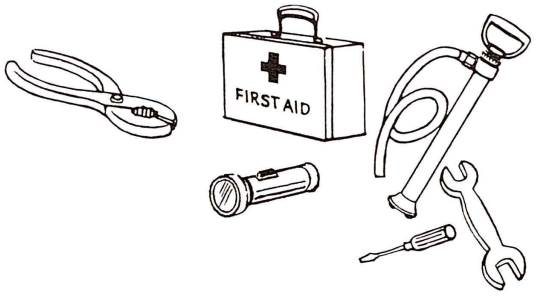
Your flashlight should be a sturdy and, if possible, watertight piece of equipment. It should have a "press-button flasher" on it so that signals may be sent or attention drawn to your position. Keep the batteries in good condition – renew them frequently.

DISTRESS FLARES

These are generally hand signals when manufactured for small boats and give off a bright red light to attract attention to the position of the boat. During the day, smoke signals replace the light, the smoke having a distinctive orange colour.

In some makes, the day and the night signal are contained in one holder.

These units are good safety measures, require no maintenance, and do not take up much room. They need to be renewed every two or three years depending upon the maker's advice. After expiry of this period they become **dangerous** and should not be used for **any** purpose.



FIRST AID KIT

This need not be extensive unless you are making a long voyage. It should contain bandages, cotton-wool, disinfectant, sticking plaster, and burn dressings. A pair of scissors, a pair of tweezers, and a bottle of sun-tan lotion may also come in handy! A first aid instruction pamphlet from one of the recognised societies is recommended in addition.

SOUNDING LINE

This is convenient for coming to an anchorage in a strange area. A lead weight is securely attached to a line and one can "plumb" the depths. Knots or marks put in at every 6 ft will tell you the depth at a glance. Your boathook, if you carry one, can be used for shallow sounding. Mark out its length in feet with rings of white paint.

EXTRA MOORING LINES

Unless your boat is securely held close to a wharf or jetty it may break free and damage itself and other boats. The larger the boat the more damage can happen – tie her securely. Remember the continual movement of the boat in the water can chafe through your ropes where they pass through leads to the shore. Guard against this by tying canvas round the rope or fit strong plastic or rubber tubing where they are liable to chafe. Extra rope always comes in handy. No hard-and-fast rule about length of rope can be given. You should consult experienced boatmen in the area you use.

SPARE ENGINE PARTS

It is wise to carry engine parts such as spare spark plugs, leads, and drive belts before going out on open waters. **Remember to bring a spare starting cord for that outboard!**

RADIOTELEPHONE

Owners of boats large enough to cruise in semi-protected and open waters should carefully consider the question of purchasing a radiotelephone communications set. In modern-day boating the use of this apparatus can be of great benefit and is well worth the cost.

In addition your **Mind** should be equipped with the following information before you take your boat out:

(1) Knowledge of local rules.

(2) Knowledge of weather expected.

(3) Knowledge of tides and currents and

Somebody Else's Mind Should Be Equipped With Information Of

(1) Where you are going, and,

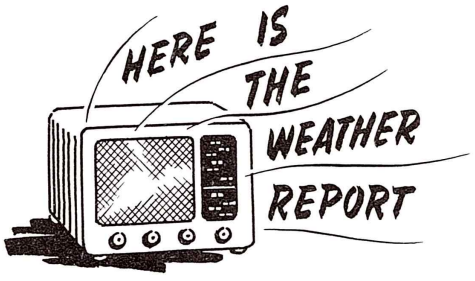
(2) What time you expect to be back. **Just in case.**

(*See* 10-minute form on page 95.)

FIRE EXTINGUISHERS—*see* pages 73–75.

DO NOT FORGET to secure your gear in the boat.

In the smallest boats equipment such as rowlocks should be attached to the seats with lanyards.



WEATHER

The wise boat owner is always aware of the weather. A few minutes spent checking the existing weather and sea conditions may save your life. Listen to the latest weather reports before going out in your boat. If the forecast is bad, *stay home.*

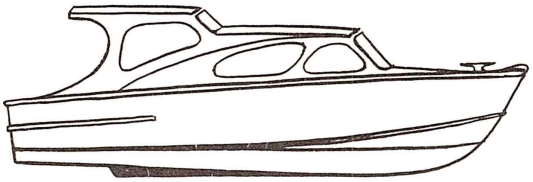
You should not think that by doing this you are being penalised for your lack of experience. Most experienced boatmen are the most cautious, probably because they have had one or two "frights" and no longer take chances.

When on the water you should continue to keep your "weather eye" open because, even in apparently fine weather, squalls or storms can arise and endanger your craft.

At the first sign of threatening weather you should seek shelter – not necessarily at your "home" mooring if it is too far away.

Detailed information regarding weather broadcasts (N.Z. coastal broadcasts and storm warnings) is given in N.Z. Nautical Almanac. Information on weather broadcasts for yachtsmen is also included in the same publication.

BE WISE – BE WEATHER WISE



THE MOTOR LAUNCH REGULATIONS

Harbour boards have their own bylaws for the waters under their control so the Motor Launch Regulations apply to all other sea waters and to all navigable lakes and rivers. Many harbour boards have made their bylaws similar in extent to the regulations to ensure as far as possible that there is uniformity throughout the country.

Over recent years many complaints have been lodged that the noise of boats has disturbed local residents, picnic parties, and fish.

Do you know that the exhaust from your boat motor must be discharged through an efficient silencing device?

Other complaints have also been received about the behaviour of power boats and water skiers in anchorages and near crowded beaches.

Do you know that it is against the law to travel at a greater speed than 5 miles an hour when within 200 yd of the shore or when passing within 100 ft of any other vessel whether under way or moored, or any person bathing or fishing?

This regulation was passed so that the public could swim and bathe in safety, knowing that a speedboat or water skier cannot create a nuisance or constitute a danger close to the shore.

The erosion of some river banks has been attributed to the wash of vessels and water skiers, so *watch your wash.* It might capsize a small craft or damage boats or property along the shore.

Do you know it is an offence to travel at a greater speed than 5 miles an hour when within 200 yd of certain defined harbour works and river bank protection schemes?

With the upsurge of the sport of water ski-ing it became necessary to provide for some means for the skier and tow boat to have access through the speed restricted area when proceeding to and from the shore. Water skiers are unable to proceed at so low a speed as 5 miles an hour.

Do you know that water skiers and their tow boats may not leave or approach the shore except in a properly designated "access lane" or where a special area of water has been set apart in which the speed restrictions do not apply?

It is possible for water skiers to swing from side to side of the track of the tow boat but

Water skiers may not enter the restricted speed area, even though the towing vessel keeps at least 200 yd from shore.

It becomes difficult for a tow boat driver to watch a skier and the water ahead at the same time.

Do you know that boats towing water skiers must carry another person as well as the driver?

There are many navigable waters less than 400 yd across and under normal circumstances prohibited to vessels travelling at a greater speed than 5 miles an hour.

Provision, however, has been made in the regulations for suitable parts of such waters to be declared available for use by motor boats and water skiers where the 5 miles an hour speed restriction would not apply.

As with motorcars, drivers of speed boats should be a responsible age.

Do you know that in order to drive any power boat capable of 10 knots or more, the driver must be at least 15 years old?

From time to time special regatta days, boat races, speed trials, etc., require to be held in areas where no access lanes or special areas have been declared.

Supervising officers have been appointed in many places. They have power to authorise the suspension of the Motor Launch Regulations for special regatta days, etc.

No one would claim that regulations are the cure for all evils – traffic laws don't stop car accidents – it is only the strict enforcement of the law that can hope to keep the accident rate down.

That is a state of affairs we do not want to reach in boating and water ski-ing, and it can only be avoided by strict observance of the regulations. The responsibility is with the boat owners and skiers themselves.

Outside the Motor Launch Regulations the normal rule of the road at sea or the local harbour bylaws make provision. All are framed with one object in view – safety afloat – and all are based on common sense, courtesy, and consideration for others.

CAUTION – Amendments may be made to these regulations at any time.

Procedure for Application for Declaration of Access Lanes and Special Areas of Water

Where can access lanes be established?

In any areas of the sea or in a lake or river where there is no harbour board or other controlling authority and where the waters are of such an area that motor launches and water skiers are able to operate outside a mark 200 yd from shore.

Where can special areas be declared?

In narrow or confined waters less than 400 yd across or where it is desirable in the interests of other users of any water to keep water ski-ing and speed boating confined to special areas.

Who can make an application?

Any person or club wishing to water ski or travel in a motor launch at speeds greater than 5 miles an hour when within 200 yd from the shore. It is desirable that all applications should be made through the territorial local authority.

Where are applications to be made?

To the territorial local authority who will send the application with its comments to the nearest of the following district offices of the Marine Department: Auckland, Wellington, Nelson, Westport, Christchurch, Dunedin and Bluff. If in Lake Taupo to the Controller of Wildlife, Department of Internal Affairs, Rotorua or the Harbourmaster, Taupo.

What information is required in an application?

A word description of the access lane or special area with mention of at least one geographical feature as a commencing point for the coordinates enclosing the area of water to be defined. A plan in duplicate showing: geographical features of the area; the siting of the access lane or area in relation to some definite point; measurements of access lane or special area; siting of buoys and/or transit posts to

mark the lane or area; situation of bathing sheds, yacht anchorages, boat landings, fishing stands, structures in the sea, access roads to beach, etc.; suggestions as to marking, buoys, beacons, notice boards, etc.; and an undertaking to comply with any conditions imposed.

Specimen type of Minister's notice in the Gazette *for access lane may read as follows*

The Motor Launch (Place) Notice 1967—(Name of local authority)

PURSUANT to the Motor Launch Regulations 1962, the Minister of Marine hereby gives the following notice:

1. (a) This notice may be cited as the Motor Launch (Place) Notice 1967.

(b) This notice shall come into force on the date of its publication in the *Gazette* and shall remain in force for a period of (period stated) after that date.

2. Subject to the conditions set forth in the Second Schedule hereto, regulations 11 and 12 of the Motor Launch Regulations 1962 shall not apply with respect to the area described in the First Schedule hereto.

FIRST SCHEDULE

1. All that area of water at (place) bounded on the sides by parallel lines 100 yd apart, extending in a 307° true direction 300 yd from the edge of the water,* the northern boundary commencing 90 yd southwards of the groyne at the northern end of the bay.

2. All that area of water at (place), bounded on the sides by parallel lines 150 yd apart, extending in a 280° true direction 200 yd from the edge of the water,* the northern boundary commencing 100 yd southwards of the beach access at the end of (named point).

SECOND SCHEDULE

EACH access lane shall be marked as follows:

1. Two 8 ft transit posts with a distance of not less than 20 ft between and painted with 12 in. bright orange and black stripes shall be erected on land in line with each side of the access lane, the first post being sited on the lake margin.* A marker buoy, either barrel, drum, or spherical shaped, painted orange with a vertical black stripe, shall be moored to mark the lake† end of each side of the access lane.

2. On each of the transit posts sited on the lake margin* there shall be fastened in line with the sides of the access lane a notice board measuring not less than 2 ft 6 in. by 2 ft painted orange with black lettering.

3. The aforesaid notice board shall contain the following notice:

"NOTICE
Motor Launch Regulations 1962

Access lane through which motor launches and water skiers may pass at speeds greater than 5 miles an hour.

Bathers Keep Out"

Dated at Wellington this day of 19

, Minister of Marine.

*Substitute "high water mark" where access lane is in the sea.
†Substitute "seawards" where access lane is in the sea.

What other organisations need to be consulted?

Any application requires the written support of the territorial local authority in the area. The views of the local acclimatisation society should also be forwarded where the request for lifting the speed restriction is for a lake or river.

Who pays for and places the marker buoys transit posts and notices?

Although the local authority may be named in the Minister's Notice in the *Gazette* it is the responsibility of the persons using the areas to pay for and maintain the buoys and notice boards.

When do marker buoys and notice boards need to be placed?

Only when water ski-ing or speed boating is being carried out.

What are the shape and colour of ski-lane marker buoys and transit posts?

Marker buoys are barrel, drum, or spherical in shape. The drum and barrel should be floating on their side. The buoys should be painted orange with a single black vertical stripe.

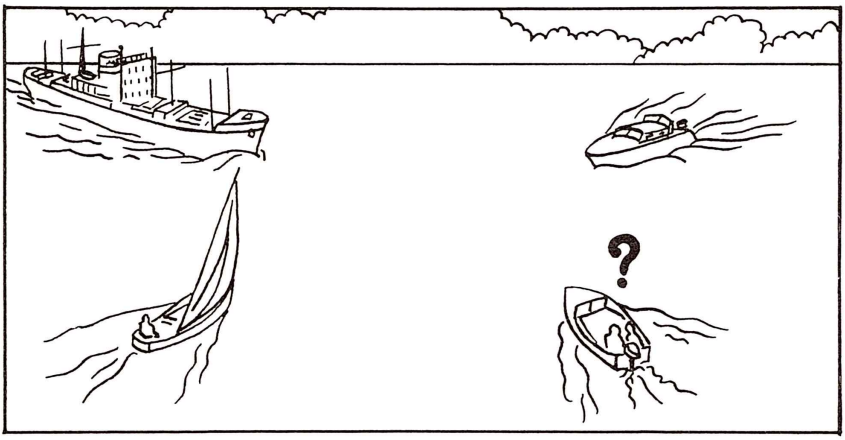
Transit posts should be painted with 12″ bright orange and black bands.

What rules apply to boats using the lane?

They must keep to the right and must not loiter in the lane.

RULE OF THE ROAD

See Appendix II for full contents of Collision Regulations.



All traffic (which means the transport of vehicles) must conform to certain rules, otherwise confusion and danger arise. Road traffic, as everyone is aware, is guided by certain principles among the most important of which is the side of the road on which to drive. In some countries, like our own, it's the left-hand side; in America and the continent of Europe it's the right-hand side. It doesn't really matter which side it is as long as the other fellow **knows as well as you do.**

When one comes to look at sea traffic several difficulties or, at least differences, show themselves. For one thing there are no roads carefully marked out, although there are channels and fairways. In the open sea, and in large harbours and lakes, other vessels can approach and be approached from any direction. Also, and this is most important, the principles or rules on the open sea must be international – Japanese, Americans, and Danes must know their obligations and adhere to them. A collision between cars is bad enough, but think of the danger involved in ships weighing many thousands of tons striking each other. All countries now combine (and have done so since as far back as 1889) to draw up rules which make navigation among other vessels a safer practice.

A lot of experience, a lot of time, and a lot of money have gone into making these rules. They've stood the test of time and it is doubtful if they can be improved upon, except for small refinements.

Since most of your pleasure will be derived on lakes and harbours, something had better be made clear at the outset. Local rules are

allowed and because of the shape of a particular harbour it may be necessary for the harbourmaster to draw up a special rule to help traffic. As much as possible, the rules in a harbour are made to conform with the international rules. Look out for these exceptions and special rules – gain knowledge of the particular area in which you wish to sail – a phone call to make enquiries about a busy harbour may pay dividends.

Do big ships have to obey the international rules in restricted waters? The answer to that is – it is **your** duty to keep out of the way of big ships in channels and near wharves. This is a New Zealand Government regulation contained in a publication called the General Harbour Regulations. It makes sense since small vessels are more manoeuvrable than large ones and can use shallower water.

The actual regulation reads:

> **"The Master or person in charge of every motor launch, yacht, or small sailing or rowing boat shall, when that vessel is in a narrow confined channel, or when within 500 yd of any wharf, keep out of the way of any vessel of 500 tons net register or upwards."**

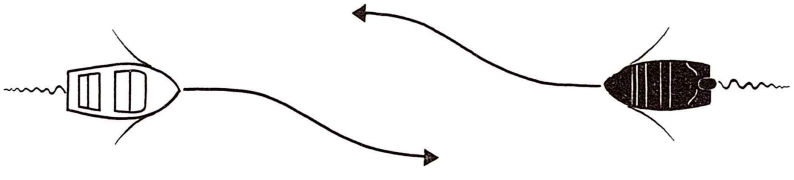
In diagrammatic style the basic international steering and sailing rules are shown below.

What happens if you don't observe these rules? Well, you are guilty of a crime, and any damage caused through that lack of observance will have been caused by your wilful neglect – which boils down to the fact that you will probably have to pay for it.

Caution should be exercised at all times. Never take chances by relying entirely upon the speed and manoeuvrability of your vessel, or by guessing at the capabilities of another vessel.

Rule 18

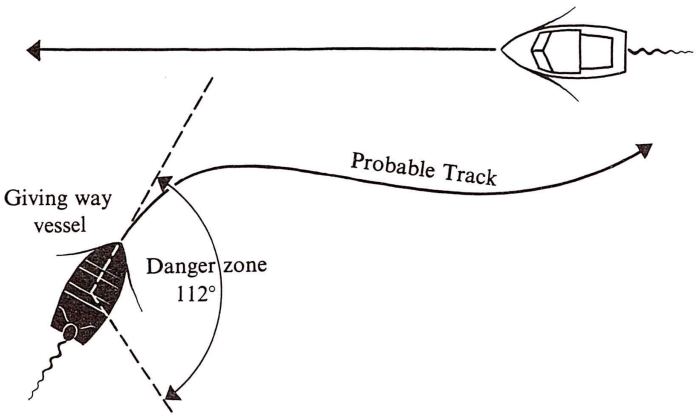
When two power-driven vessels are meeting end on, each shall alter course to starboard (right) so as to pass on the port side of the other.



Note: A vessel towing has no privileges and conforms to the rules as for any other power driven vessel.

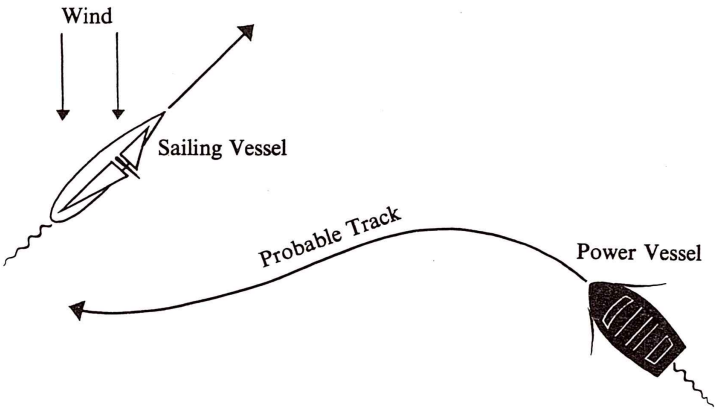
Rule 19

When two power-driven vessels are crossing so as to involve risk of collision, the vessel which has the other on her own starboard (right) side shall keep out of the way.



Rule 20

When a power-driven vessel is in danger of collision with a sailing vessel, the power-driven vessel gives way, except in a narrow channel where a large power-driven vessel may not be capable of manoeuvring to keep out of the way of a sailing vessel.



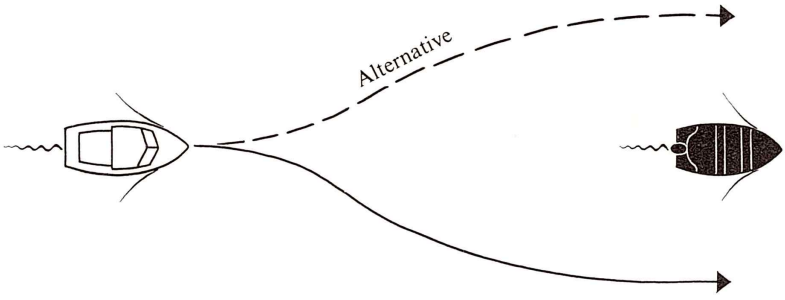
Rule 21

When another vessel gives way to you under the rules, you are obliged to maintain your course and speed, until action by the other vessel alone will not avert collision.

Rule 22
When giving way to another vessel, avoid crossing ahead of him.

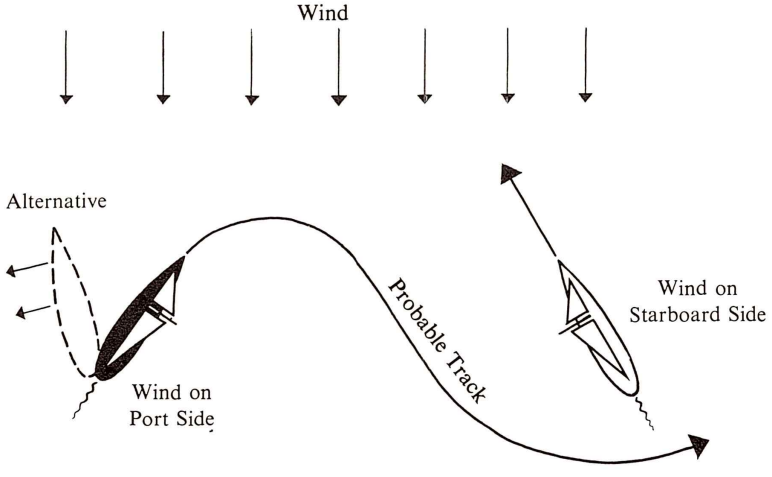
Rule 23
If necessary use your motor to stop your boat or go astern – but only if you are the giving-way vessel.

Rule 24
The overtaking vessel gives way.
This applies to *any* overtaking vessel, which *includes* sailing vessels.

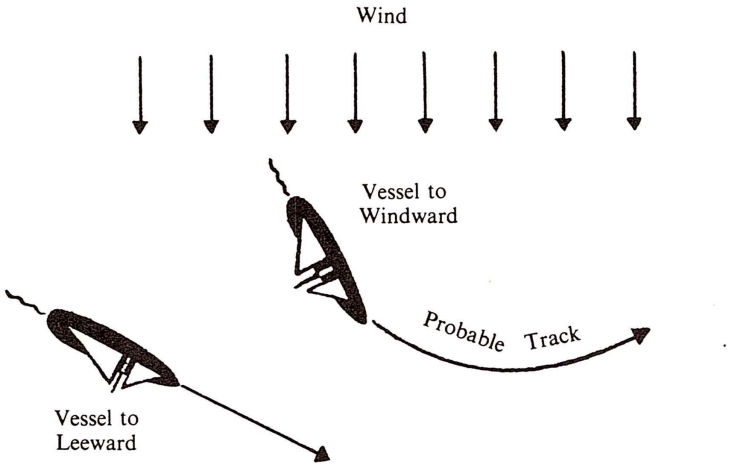


Rule 25
When in narrow channels keep to the starboard (right-hand) side, and if less than 65 ft in length do not hamper larger power-driven vessels.

Rule 17 (a) (i)
When two sailing vessels are approaching one another so as to involve risk of collision and have the wind on different sides, the vessel which has the wind on the port side keeps clear of the other vessel.



Rule 17 (a) (ii)
When both have the wind on the same side the vessel which is to windward shall keep out of the way of the vessel which is to leeward.



Rule 17 (b)
The windward side is that opposite to that on which the main sail is carried or in the case of a square rigged vessel the side opposite to that on which the largest fore and aft sail is carried.

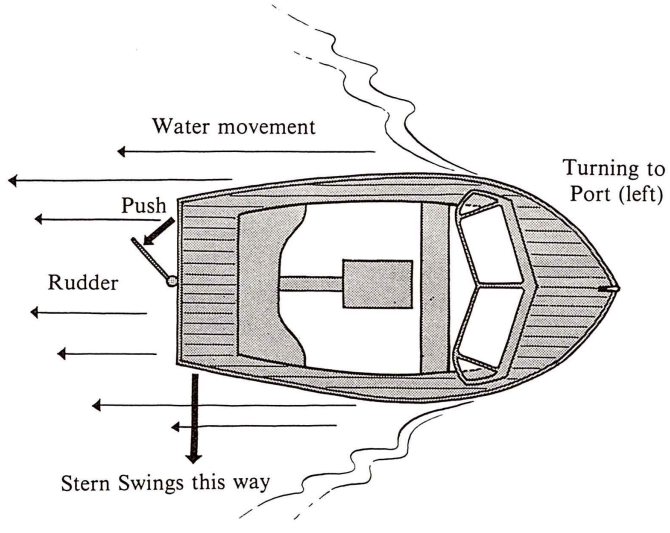
Note: The collision rules have been condensed and simplified as a guide. Attention is drawn to the regulations contained in Appendix two for full details.

BOAT HANDLING

Some knowledge of the basic principles involved in boat handling is necessary before first attempting it.

There is a strong tendency among new boat owners who haven't had much experience to assume that their boat will handle like a motor-car. Turn the wheel to the left and the boat goes round to the left and vice versa. What **appears** to happen and what actually **does** happen are independent factors.

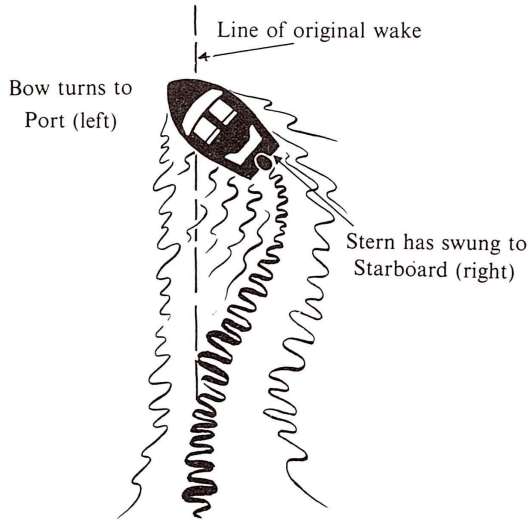
A car is guided by the angle taken by its front wheels – the wheels pull the front of the car to one side or the other. On a boat, however, the guidance is not done at the front of the boat but at the rear or stern. The rudder is worked by the pressure of water upon its surface and the pressure is caused by the speed at which the boat moves forward. It follows, therefore, that the rudder will have to be put at a greater angle when the boat is moving slowly. At speed, a slight movement of the rudder will deflect the stern.



The principle of the jet boat or the outboard engine may be clearer – the idea of the jet being diverted to one side or the other in order to swing the stern around can be quite easily imagined. Much the same

principle is used with a rudder – the stream from the propeller is diverted and this causes the stern to swing.

The most important factor emerging from this is that, unlike the car, a boat turns mainly by swinging its stern **in the opposite direction to the turn.**



When drawing away from the dockside, you should be careful to avoid scraping your stern – which you will scrape if you try to turn the boat too quickly. If you are proceeding along very close to a jetty at speed and turn the bow away quickly you will discover that the stern meets the jetty with a jolt strong enough to damage the boat – perhaps enough to loosen your outboard mountings. (In any event speeding near a jetty is against the law (see page 20).)

A point to watch for when leaving a jetty is to make sure that any ropes which you have used to make fast your boat do not get into the water and come into contact with your propeller. Because of this you should always get your ropes aboard smartly.

BERTHING

Whether an outboard or a large motor boat the principles involved in berthing or tying up to a mooring buoy or another vessel are the same.

The most common mistake is in approaching too fast. This would mean that a slight mistake in judgment, or a mechanical failure, could result in damaged jetties, smashed boats, and a great deal of embarrassment. After a period of extended cruising realisation of a vessel's speed through the water is often lost. This may cause an approach much faster than you intended.

It is a good practice (and not necessarily a beginner's one either) to bring your boat to a standstill, dead in the water, several boat lengths from the dock. This will give you an opportunity to observe the combined effect of the forces of nature such as wind and current so that you can plan your approach accordingly.

Always approach head on to tide or current or wind or whichever is the stronger and approach the landing at about an angle of 30° with the line of its edge. Go slowly towards it by alternately going ahead and then stopping the propeller. As the bow of your boat comes closer, turn slowly until parallel to the landing. Put the engine astern to check the forward motion and secure your lines to the wharf. Make sure that you keep the ends of your ropes clear of the moving propeller and the adjacent area (remember that the propeller could pull the rope in towards it). Put out a bow line first. This is important if the tide and wind are strong.

Take into account the rise and fall of the tide should you be coming ashore for a considerable length of time. If your mooring lines are too short, the falling level of the water may lower the boat and break the lines and your boat will drift into the open water.

When coming alongside a crowded wharf with many other boats already tied up, have your softest fenders ready over the side to prevent damage to other boats. Also remember that the man whose boat is on the inside near the jetty may wish to leave long before you and you cannot expect him to handle your boat as well as his own when he is manoeuvring to get clear. Stay fairly handy to the boat and return at short intervals.

CHARACTERISTICS AFFECTING CONTROL OF A BOAT

DESIGN OF THE VESSEL

The size and shape of the hull, draft, weight, and amount of superstructure all affect the manoeuvrability of a boat. Vessels with shallow draft and short length are handled easily and quickly, but are readily affected by wind, whereas vessels with deeper draft and longer length are slower in manoeuvring and are more affected by currents than smaller craft in the same force of wind.

Every boat has individuality and no two boats will handle in exactly the same way.

POWER

The type and size of the power unit have an important effect on the way a boat handles. Each type of power has its own peculiarities and no set of rules can be devised to cover all types.

Petrol Engines

In operating this type of engine, extremely slow idling is to be avoided when shifting the clutch into forward or reverse speed since petrol engines may stall when the engine is turning too slowly. Petrol engines have a wide range of speed, but have a low heavy duty efficiency which places a limitation on their marine use.

Diesel Engines

This type of engine is economical and requires less maintenance. It is simple and sturdy and less subject to mechanical failure than petrol types.

Outboard Engines

Here manoeuvring is restricted since in most cases outboards have no means of reversing and boats generally have to be paddled or pulled when required to go backwards.

Power Required

The size and output of a vessel's power unit depends on the ultimate use of the boat and the design of her hull. Too powerful engines must be avoided in fragile boats or danger of shaking the boat to pieces will occur. (There are instances of this happening.) *Before you install an engine or buy an outboard, make sure* by inquiry from a reputable boatbuilder or an experienced small boat man that the construction of the boat is adequate.

PROPELLER

Excluding jet-boats, all power boats are driven through the water by their propellers, the action of which is similar to that of a fan drawing in water from forward and pushing it out astern in a rotary motion.

The "pitch" of a propeller means simply the distance through which the propeller would move in a solid substance when it turns through one revolution. Instead of working in a solid medium the propeller is in water, which is a yielding substance, and, in consequence, the water recedes under the action of the propeller and the vessel moves forward per revolution a distance which is less than the pitch. The difference is called "the slip".

The action of the propeller when in motion creates forces which affect the manoeuvrability of the boat.

In most small boats the effect of the turning propeller is not noticeable and can be discounted, but in larger ones the stern is moved to one side or another depending upon whether the propeller is going ahead or astern, even with the rudder in the middle position.

Most propellers turn right handed, that is clockwise when looking towards the bow. This means that the stern of the boat will almost always "creep" to starboard when the propeller is going ahead and to port when going astern.

Figure (a) shows the ahead position. The propeller has been designed for this, but the arrow indicates the direction in which the propeller tends to move in a sideways direction. Therefore in this case the *stern* will move to *starboard* (right) and the *bow* to *port* (left).

Figure (b) shows the propeller going in reverse. In this position it is not as efficient as in (a) and the sideways effect may be more pronounced. This will make the stern go *to port* and the *bow* to *starboard.*

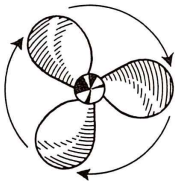


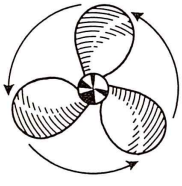
Fig. a

Tendency to movement
Propeller in ahead position

Looking from Aft

Fig. b

Tendency to movement
Propeller in Astern Position



Looking from Aft

These "sideways" effects vary from boat to boat, but can be used to advantage when mooring alongside or moving out amongst crowded boats. The new boat owner should try his own boat, choosing a free area of water and in good weather putting his engine ahead and astern at moderate and fast speeds. Short bursts of full speed will probably give the greatest effect.

A left-handed propeller will give opposite results. Boats with twin screws generally have one turning in a different direction to the other so that the effect of sideways motion is cancelled when both are going at the same speed.

Cavitation

When blade tip speed is excessive for the size and shape of the propeller the combined pressure of atmosphere and water cannot supply solid water to the plates and cavities or bubbles are formed around the propeller. This phenomenon, called "cavitation", shows itself by sharp and progressive increase in revolutions per minute without any increase in thrust and is accompanied by a loss of efficiency. When cavitation is fully developed it will limit the vessel's speed, no matter what power is used.

It is therefore important that the right size and pitch of propeller are used in conjunction with the power of your engine. Adhere closely to the maker's recommendations to get the best performance from your boat.

Using Propeller "Sideways" Motion

We have said that when going astern (presuming the boat is fitted with a right-handed propeller) the stern will go to port and the bow will appear to go to starboard.

A boat, approaching a landing stage and intending to put her left side towards the jetty, should approach the lie of the stage at a slight angle so that when the engines are shifted to "astern" the stern will swing in. After some practice, the boat will meet the landing stage broadside on and stopped.

WIND

The effect of wind on a boat varies with the size and position of the superstructure and draught. The individual owner will have to gain his own knowledge since conditions vary so much.

CURRENT

Unlike the effect of wind, currents and tidal streams take full control over small boats. Although your boat appears to be stopped on the water, river currents (for example) will move your boat down towards

the sea. You will have most control over your movements if the bow is directed straight into the current, using your engines to balance or overcome its speed. (Do not forget that currents may prolong your trip so make sure you have enough fuel.)

TWIN ENGINES

The boat owner using two engines in his boat has not only an additional safety factor but has two engines to assist him in manoeuvring. By putting his port (left) engine ahead and the starboard (right) engine astern his boat will almost pivot around its centre, the bow going to starboard. He is able to reverse this procedure or increase the astern movement or increase the ahead movement in any number of combinations to help place his boat where he wants it.

BOATMANSHIP

ROLLING

A boat is said to be rolling when waves or swell approach from the beam and cause her to list alternately to port and starboard. Rolling is not in itself dangerous, but in small boats there is a hazard that the boat may be swamped if she rolls too heavily and a wave bigger than the rest comes along. It should also be known that, if waves are a certain size, a boat may tend to increase her roll each time, finally rolling violently if not actually capsizing.

If a boat rolls uncomfortably, this can be reduced by directing the boat not *along* the waves, but slightly across them.

PITCHING

A boat "pitches" when the bow is presented to the seas and is lifted up on the crest of one wave to be dropped into the hollow of the trough. Since the length of the vessel gives it greater stability in relation to waves approaching it from bow or stern, pitching is not normally a serious problem.

POUNDING

This is the effect of the bottom of the boat "smacking" on to approaching waves. Damage will result if this is kept up. To stop it, speed should be reduced until pitching only is encountered.

HEAVING

This is the vertical motion of a vessel rising and falling due to surface disturbances. It is not encountered very often except in conjunction with pitching and rolling.

CHOPPY OR ROUGH SEAS

Sheltering

Hard and fast rules are virtually impossible to make regarding the best action to take in rough seas. The owner or skipper should give as much attention to how the vessel rides the crests as to sailing in the direction desired. In other words it may be necessary to forfeit the trip or a portion of it in order to put the boat in a position where she will be reasonably comfortable and secure. If a vessel finds herself in rough water in the open sea it is wise to head for shelter from the wind and sea at the nearest place – which need not necessarily be the home mooring. Better to be in moderate seas and waiting in safety than have rough seas break up the boat attempting to get home.

Broaching to

In choppy or rough seas avoid allowing your boat to be broadside on to the waves, unless you are certain that she will not roll too much and be swamped. This is one of the most dangerous situations in rough seas – sailors call it "broaching-to". Under these circumstances the boat may be under a breaking crest for an instant too long, presenting its whole length to the entry of water. As she rolls from the previous crest she may tend to roll into the breaking one. In a second the boat is swamped and you are in trouble.

River bars

There are many rivers in this country which have shallow entrances called "bars". Under certain circumstances of the tide and wind dangerous waves like surf are formed. These can be fatal to a small boat if she is caught unawares. Before crossing a bar find out from local boatmen which is the best time in relation to the state of the tide and wind for your size of boat.

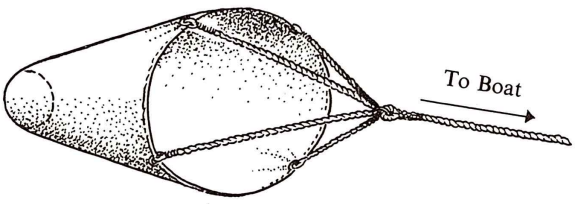
The principal danger of a bar is its unexpectedness. At one moment smooth river water and the next moment quick high waves are seen. Before nearing the bar you should tie down all loose gear and have your engine *thoroughly* heated up. This is to avoid stalling, which could allow you to become broadside on.

When you are to seaward of the bar and intend to enter, always assume that it is dangerous and use the utmost caution.

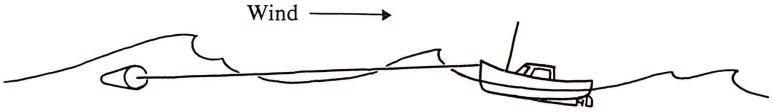
Safety in waves

When the engine is working normally there is not much difficulty in keeping the bow into the wind and sea. However, with considerable movement, it is not unlikely that air locks may form in the fuel leads and the engine stall. What do you do for safety when the engine fails? Well, you must keep the boat head to wind in some manner. The easiest and probably the only way of doing it, is to attach a line to a plastic bucket (or something similar) and throw it over the side, making sure the other end of the line is made fast aboard near the bow. The bucket "grips" the water and the wind will blow your boat down to leeward, at the same time pulling the bow into the wind and seas. This contraption is termed a "sea anchor" and is a very necessary piece of equipment in rough weather. Sea anchors can be specially constructed. They consist of a canvas cone, open at the smaller end and a frame around the larger end to allow the sea to enter. It acts as a drogue.

SEA ANCHOR



With the movement of the boat in rough weather the line holding the sea anchor is liable to chafe. You should guard against this by wrapping sacking around it or fitting a piece of split hose where it leads over the bow.



Considerable thought should be given to carrying a properly built sea anchor if you intend to do extended cruising in waters liable to become rough.

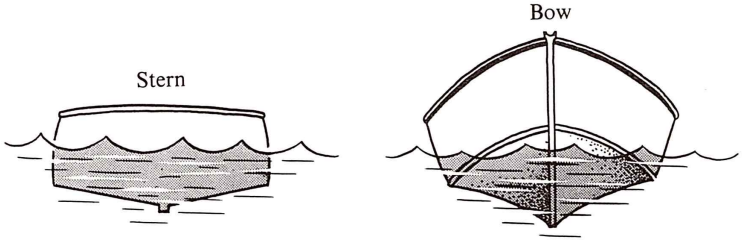
Surf

Should it at any time become necessary to land on a beach on to which surf is breaking, or should you find yourself drifting towards one without power, then you must keep your boat end on to the breakers. If she broaches to, you will capsize. You must use a drogue of some kind, either at the bow or the stern, to allow the boat to come gradually closer to the beach.

In general, keep well clear of surf.

Running before the seas

To "run before the seas" might seem a sensible thing to do – "If you can't fight it, go with it." But this isn't necessarily so. In the first place, you have noticed that most boats have high bows and low sterns – water is more easily admissible over the stern. Also the shape of the ends of boats is entirely dissimilar, in most cases the stern is wide and open. With the waves directly astern, a breaking crest may overtake



the boat and swamp the stern – making it even lower in the water. The next crest will find entry easier until the boat is swamped or broaches to.

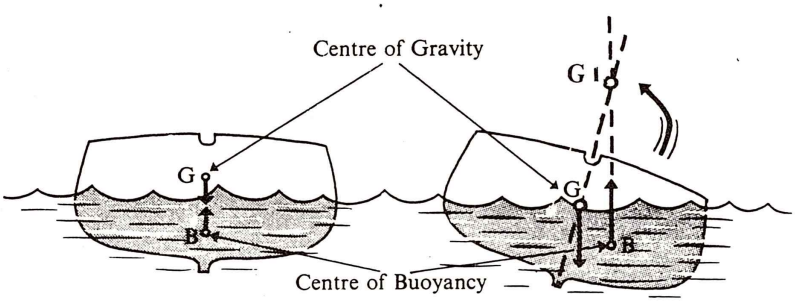
Small boats can be swamped with one wave.

Boats will often be found to behave reasonably well in rough seas if the wind and sea are on the bow or quarter. In this position the two forces causing rolling and pitching tend to counteract each other, or at least the boat does not build up a momentum to make its condition worse. With the sea on either quarter (going in almost the same direction as the boat) an advantage is gained from the fact that the vessel is not fighting the sea and wind. There is less danger that the waves will break over the stern because the roll introduced by such a course will tend to roll the weather quarter away from the approaching sea. Steering may become difficult, if not impossible, and in this case you should "heave to" bow on to the waves. Be careful turning the boat around. Sometimes steering is helped by putting out a drogue over the stern when running with the wind on the quarter.

STABILITY AND SEAMANSHIP

Stability is the ability of a boat to return to the upright when it has been heeled by an outside force such as wind effect or sea effect. All weights in a vessel can be imagined as acting at a point called the centre of gravity. The resultant upward thrust of water on a vessel can be imagined as acting at a point called the centre of buoyancy. When a vessel is upright the centres of gravity and buoyancy are on the same vertical line. When the vessel is heeled the centre of buoyancy moves to a new position off centre. Thus the forces of buoyancy will push upwards through the new position of the centre of buoyancy and the forces of gravity (weight) will act downwards through the position of the centre of gravity. A turning effect is produced which brings the vessel back to the upright position, and centres of gravity and buoyancy will again be in same vertical line. From the diagrams it may be observed that the higher the position of the centre of gravity, the smaller is the turning or "righting" effect. It is therefore necessary to control the position of the centre of gravity to ensure it is not too high. If centre of gravity was at G1, vessel would have no power to return to the upright and would remain at the heeled position.

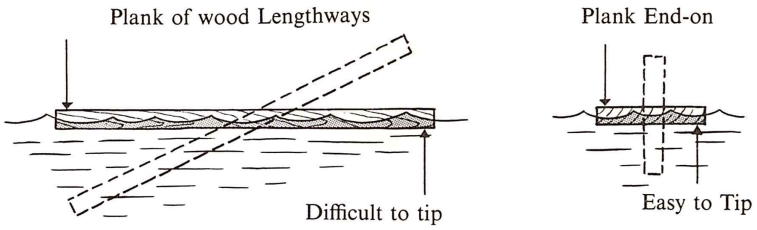
The practical application of this is that weights in a boat should be stowed uniformly and particularly stowed as low as possible. Large movable weights in a boat should be securely lashed, as moving weights have an effect similar to raising the centre of gravity.



In "upright" case "G" is above "B" and the two forces cancel out.

In this case "G" remains in the same position while "B" moves outwards. These two forces now cause a turning movement bringing boat to an upright position again.

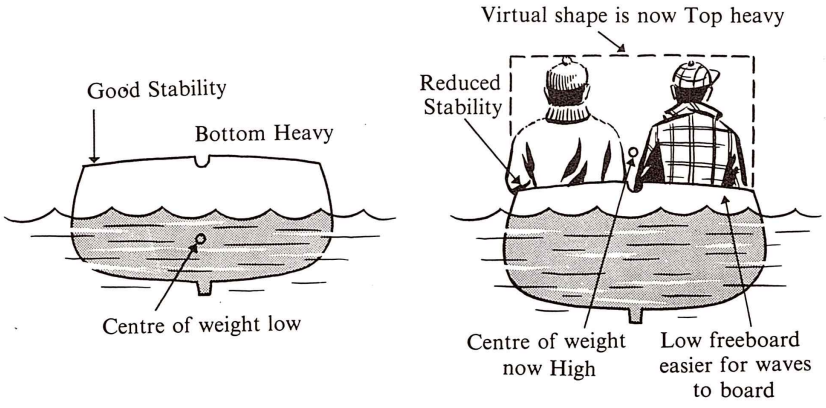
Imagine a plank of wood floating in water. Turning the plank over sideways takes little effort compared with attempting to turn it end over end. So, too, with a boat. It is practically impossible to tip a boat



over end for end, but it is not difficult to tip over a narrow boat sideways. Remember this fact when clambering into a small boat – always step carefully into the *centre* line of the boat, *never* on the side, no matter how tempting it is to place your foot on a step.

The average reader might assume that the most satisfactory stability condition for a boat would be one that quickly "snaps" the boat back into its original upright condition. This uprighting force depends upon the size of the boat.

In small boats a quick return to the upright is desirable because persons sitting on the seats reduce this "quick return" effect quite considerably. The reason for this is that the presence of more weight higher up in the boat changes the virtual shape.

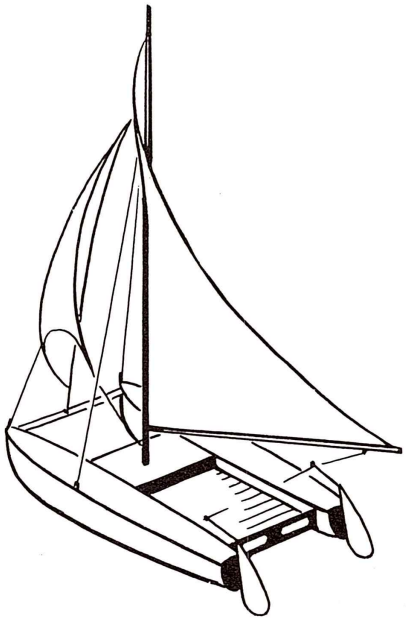

Good Stability
Bottom Heavy
Centre of weight low
Virtual shape is now Top heavy
Reduced Stability
Centre of weight now High
Low freeboard easier for waves to board

The boat becomes "top heavy" and slower in returning to the upright. One can therefore imagine the effect on a small boat by a person standing up. The natural form of the boat to return to the upright has now been cancelled and the boat will capsize without the application of much effort.

In larger boats a quick return to the upright gives a violent motion, especially when a vessel is rolling, and this is uncomfortable for persons living aboard. Not only that, but the boat rolls with a quick, jerky movement which loosens fastenings, fittings, masts and stays, etc. For the larger boat design, care is taken by the architect to give a calculated amount of stability, ensuring greater comfort by means of a slower (although not necessarily less powerful) return to the upright.

In sailing yachts a top-heavy force is supplied by the wind against the canvas of the sail. Yachts with a large sail area counterbalance this force with heavy lead keels. This allows them to have fairly narrow hulls, which enables a smoother and faster run through the water.

Nowadays, in seemingly increasing popularity come the catamarans and the trimarans (three-hulled craft) which, instead of the weighty keel, use the principle of broad beam (our plank lengthwise again) to counteract the external counterbalancing effect. In order to achieve speed, however, instead of one continuous hull they are divided along their length into two or three narrow hulls.



Summing up the stability factors then we have:

1. Vessels are extremely difficult to "tip" lengthways.
2. Vessels are easy to "tip" sideways, depending upon the beam (breadth) of the vessel.
3. Boats with broad beams are more difficult to tip sideways than boats with narrow beams.
4. Weights placed high, for example, persons standing in the boat, reduce stability and make boats easy to tip.
5. Weights placed low, for example, lead keels, make boats difficult to tip, therefore the beam can be reduced safely.
6. Catamarans are simply broad beamed boats (although of different underwater shape) and have a greater resistance to being tipped or capsized. The reason why catamarans and trimarans occasionally capsize is due to the additional area of sail which they may carry. The greater area of sail offsets the increased stability but some owners have mistakenly imagined that the increased stability permitted an unlimited area of sail to be carried.

A boat with round bilges will tend to roll more than a flat-bottomed boat of the same dimensions. V-bottomed or round-bottomed craft are safer boats in a seaway since, although they roll more quickly, there is less chance of them shipping water. Flat-bottomed boats, due to their relative "stiffness" of movement, easily ship water and should be used in reasonably calm waters only.

Power boats, although not affected by wind on sails, generally have a design which gives maximum speed from the power unit used. Therefore, in just the same way as a sailing boat, it becomes necessary in larger craft to reduce the beam as much as possible to give a smoother movement through the water. If the beam is made too narrow on a motor boat, she will be unsafe in choppy water.

Most small boats "plane" through the water. This means that, with an almost flat bottom, at fast speeds the boat rises more on the surface of the water and reduces water "drag", still allowing a fairly broad beam. In choppy water this effect is lost and the boat bounces uncomfortably and dangerously on small waves.

The boat designer has all of these factors to contend with when he designs the boat and even the newcomer to boating can see that there is much more to building a suitable boat than simply designing a unit to keep out water and with a pointed and a blunt end.

The various types of hull design and their purposes are too numerous to mention in this booklet. Most "kit set" boats are efficiently designed and are safe under normal conditions, provided the right type of motor is used, and they have been built carefully according to instructions.

There is a tendency, however, for some keen boatmen who have bought a boat to make alterations aboard to suit their own ideas. In order to give a roomier cabin in a smaller boat they decide to heighten the deck. Or they like the view from the cabin top and decide to build a windbreak and screen there, complete with steering and throttle arrangements. Perhaps on an open boat, after already putting her deep in the water by installing an engine, the owner builds higher sides, puts a top on and considers he has a safe "cabin cruiser"! (see sketch).

Top Heavy

All these practices, without first getting professional advice, are **dangerous.**

In reconstructing a boat with a cabin on top you are using the same principle as our man standing up in the rowing boat – the centre of the weight has been raised and the boat now becomes much easier to tip than the designer of the original hull intended.

Therefore, before making alterations, speak to an experienced boat owner or boatbuilder. Remember that your boat may not show lack of stability until you are among waves and then it is too late.

Loose Water

Loose water in the bottom of your boat slops from side to side in rough seas and reduces your stability. Always keep your boat as dry as possible.

ANCHORS AND ANCHORING

Anchors are necessary for most boats used for fishing, hunting, or picknicking ashore. An anchor in a boat is not only useful for anchoring in the position desired, but is also good emergency equipment. What more could one ask for, with a faulty engine and a strong wind blowing the boat down on to the shore, than a stout anchor and rope?

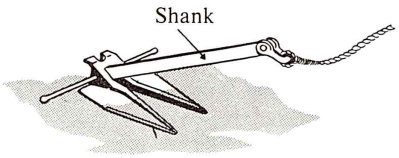
Small boats in quiet waters can be anchored temporarily and satisfactorily by a weighty object on the end of a rope, but should a breeze spring up it is doubtful whether this would hold the boat in position. Weighty objects such as short, heavy iron bars or machinery parts will do the job. One thing, though, about these "anchors" – they certainly don't look smart, and they make an untidy boat. Anchors of various kinds can be purchased (for not a great cost) at marine stores and ship chandlers or, perhaps, you can pick up an old anchor from a club or a repair yard.

What to look for in an anchor

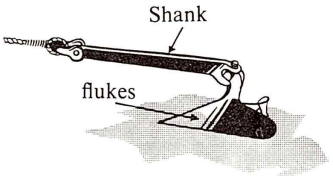
Imagine the anchor being dragged along the sea or lake bottom. Are the flukes (the digging-in pieces) sharp? Are they pointed in the direction of pull? Is the crown designed to lift the rear of the anchor and allow the flukes to dig quickly into soft mud or hard sand and gravel?

The flukes should be broad enough to stop the anchor dragging along at a uniform depth, and yet not too broad as it will be difficult to pull it out of the bottom. If a breeze has been blowing and the anchor is dug in firmly, you may have more work than you can handle. Larger boats have hand or electric winches near the bow to make lifting the anchor an easier operation.

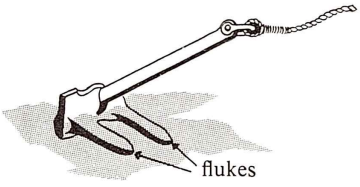
Another important point: Does the anchor stow easily in the boat? Clumsy anchors take up a lot of room. In the "kedge" type anchor the stock can move through the shank after removing a pin and stow close alongside the shank (the reason for the curve at the end of the stock).



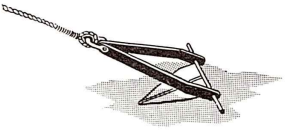
DANFORTH



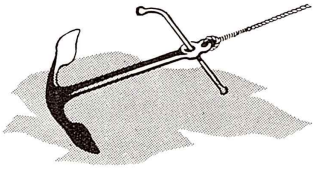
"CQR" ANCHOR



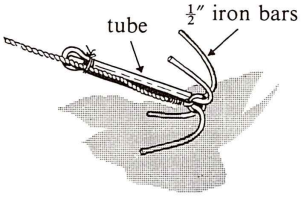
STOCKLESS OR PATENT



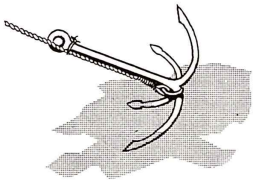
WISHBONE



"KEDGE" ANCHOR



FISHING GRAPNEL



GRAPNEL

As a very rough approximation, an anchor whose weight in pounds is equal to the length of the boat in feet would be considered satisfactory. Some anchors need not be so heavy. For example, for Danforth anchors a weight of only 22 lb is recommended for a power boat of 35 ft (10 ft beam).

The anchor rope

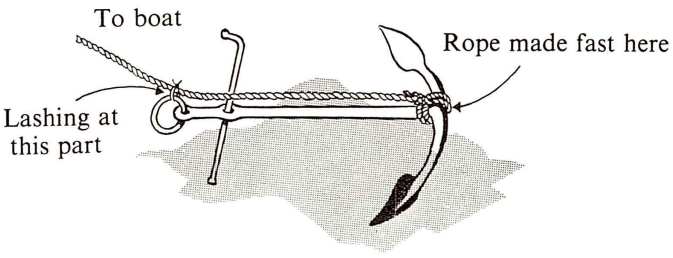
The anchor rope is an important part of the equipment. It has to be long enough to pull at the anchor horizontally so that the flukes dig in well. Any lead upwards decreases the holding power. In normal weather conditions a length of rope five times the depth of water will be found adequate; in severe weather this may have to be increased to 10 times.

These figures depend somewhat on the type of material used – i.e., chain, wire rope, hemp, coir, nylon, etc. Chain, being heavy, is excellent, but is difficult to handle and stow in a small boat. A short length of chain connected to an anchor, with mostly nylon or hemp rope brought aboard, is excellent. In this case the chain lies on the bottom of the sea and helps to eliminate chafage and reduces shock load due to waves. Don't forget that chafing can also occur where the rope leads over the bow. You should guard against this by using sacking or a split plastic tube or "pipe". Don't use an anchor rope that floats in water – sooner or later you'll get it wrapped around the propeller.

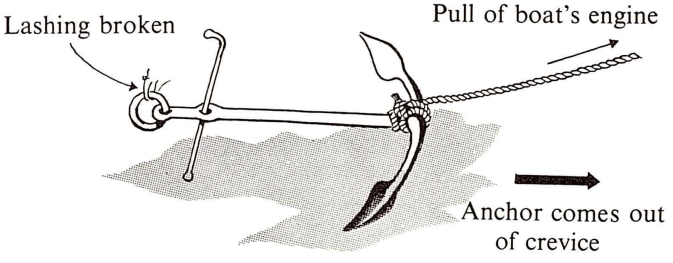
Handy hook

It happens quite frequently that boats, when fishing, need to anchor quickly and well on a rocky bottom for short periods. Since the flukes of a properly designed anchor are liable to catch under a ledge of rock, it may prove an expensive business cutting free an irretrievable anchor. This can be overcome by making a simple grapnel which will hold quite well, although it should be used only when the boat is attended carefully. Four half-inch iron bars inserted in a pipe and bent to shape (design and make it yourself) make a good grapnel. If this catches on rock, a strong steady pull will bend the iron bars straight and you can bring the grapnel aboard to be reshaped before its next use. You can also purchase a folding grapnel quite cheaply.

NORMAL USE



TO RETRIEVE



To retrieve an anchor

A handy trick used by fishermen is to make the anchor rope or chain fast to the lower part of the anchor (i.e., between the flukes), laying it along the shank and tying it with a small secure lashing to the anchor ring. Should the anchor flukes jam in a rock crevice, you give a quick hard pull (or make the rope fast and use engine power), whereupon the small lashing will break and you can pull the anchor out "backwards" from the rock ledge.

Two anchor ropes

You may find it convenient to have your anchor line in two pieces – one piece to be used for handiness as a workable length, and the two joined together if you require an overnight secure mooring or in case of bad weather. The method of joining them should be strong and must be capable of withstanding chafing on the bottom.

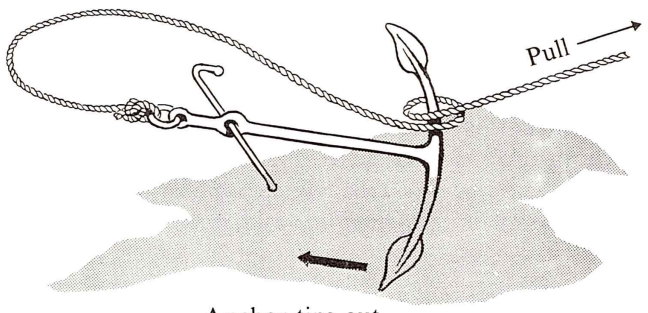
Tipping out the anchor

In some New Zealand waters the wind causes perpetual and idle swinging of the boat. This holds a particular danger for men who use the ordinary kedge anchor. With this type, one fluke is buried and grips

into the sand or mud of the bottom while the other is free of the bottom and projects out of it. As the boat swings round, the anchor rope on the sea bottom winds around the fluke, and on the next steady pull the anchor tips out of the mud and no longer holds.

One of the most common areas for this to happen is near high hills, or in places like the Sounds. Here we have the solution, for it is generally possible to anchor close to the shore and put out a length of rope from the stern to a tree or strong bush. The boat, lying snugly between the anchor and the shore line, will now be secure. This is another use for that extra length of line in your equipment list.

FOUL ANCHOR



Anchor tips out

Marking

The anchor rope should be marked so that you will know how much you have out. A mark every 10 ft will do. Chain and wire can be painted; if rope, tuck a piece of cloth between the strands where you want to make a mark.

Points for guidance when anchoring

Always make sure that the end of the rope is secured aboard the boat. (Many an anchor has been lost with all its line and chain.)

A short length of light chain on the anchor end helps to reduce wear on the rope.

Always check the depth of water and, if possible, the type of bottom before anchoring.

Don't choose an anchorage place where the water is too shallow – otherwise at low tide you may find yourself aground.

Don't anchor too close to obstructions. If the boat is swung around by the wind it may strike or chafe against the obstruction. Leave plenty of room.

Approach your anchorage heading *into* the wind or current, whichever is stronger. Use moored boats as a guide and turn your own boat in the same direction.

Before the anchor is dropped (never attempt to throw it), set the engine slowly in reverse. This helps to lay the rope along the bottom. When you have paid out rope twice the depth of water, snub the anchor rope and feel the anchor starting to hold, then pay out the required length.

Before the anchor is dropped, make sure your foot is not inside a loop of rope or chain.

Don't shut off your engine or motor until your are sure the anchor is holding.

Wait until you are satisfied your boat is secure. Thereafter, check your position regularly.

Using a mooring

A mooring consists of a heavy weight (up to a ton or so) to which a chain is attached. When not in use, the chain lies on the bottom of the sea or lake and is marked by a buoy which is attached with a smaller chain or a rope. The buoy has a loop of rope or wire on top so that your boathook can pick it up.

Approach your mooring as you would for anchoring, having someone stand by with the boathook. As soon as the buoy is aboard, pull the chain until the heavier mooring chain can be brought abroad and made secure.

If you miss picking up the buoy, do not attempt to reverse your motor. Go past the buoy carefully, circle round, and make a new approach.

WATER SKIING AND CANOEING

Tips for water skiers

1. Learn to swim proficiently before attempting to water ski. Non-skilled swimmers and all jumpers should wear an appropriate lifejacket.
2. On falling:
   (a) Recover skis, as they will keep you afloat.
   (b) Raise a hand quickly to signal boat that all is well.
   (c) If in a congested area, raise a ski so that other boats can see you.
3. Stay away from all other objects such as docks, sea walls, jetties and boats, etc. Skiers seldom get hurt from hitting the water, but have been killed from hitting solid objects.
4. Be thoughtful of the rights of swimmers, boatmen, and fishermen.
5. Don't yell "Hit it" until your ski tips are up and the rope taut.
6. When landing parallel to the shore, come in slowly and release the tow bar at a safe distance from the shore. You must not land in swimming areas.
7. When jumping, use a single handle. Double handles are dangerous in a fall as they may wrap around part of the body.

Suggestions for boat drivers

1. A skier's life may depend upon how well you handle the boat, so become proficient in boat handling.
2. Don't "hit it" until the rope is taut, until you can see the ski tips and the skier has indicated he is ready to go.
3. You must have one extra person in the boat at all times to watch the skier. Ski-ing areas are becoming more congested everywhere and the driver must watch where he is going.
4. Steer the skier away from all objects such as docks, jetties and boats, etc. Remember, you are 90 per cent of safe ski-ing.
5. Should the skier fall, cut speed immediately to find if he is entangled on the tow rope or if he has hurt himself. If the water is smooth and he is unhurt, it will normally be possible for him to be "pulled up" again. Do not approach him too quickly to give him the tow line. Should the water be too rough he will probably need to come aboard. Do it this way. Use a piece of rope (thick enough to give a handhold) or bunch together several lengths of tow line and hang a loop over the side into the water near the stern. The skier can then place his foot in the loop while in the water. He will be able to reach up, grasp the boat and pull himself aboard. (*See* Man Overboard, page 80).
6. Stop the motor when taking a skier into the boat as he may slip and be injured by the propeller. An idling motor in neutral is not a safe procedure, since the propeller may still be turning and cut the skier.

Canoeists

You are in a very frail craft. Keep away from waterfalls and larger boats.

Provide buoyancy for your canoe so that it will support you if you capsize.

If you are going out alone, please tell someone where you are going and what time you will be back.

Always wear a lifejacket where a capsize can be dangerous – in the sea, rapids, floods, and cold water.

A LIGHTHOUSE KEEPER'S REPORT

The following is a report from a Marine Department lighthouse keeper made out recently. The names and the situation have been changed. The reader will understand that good luck and the use of lifejackets were the only factors which averted a tragedy.

On Saturday, three men had a lucky escape from drowning when their boat sank about 2 miles from the lighthouse. They were fishing from an 11 ft boat when the wind made a sudden change. As soon as this happened they made for home, but the wind made the sea very choppy and made the swell break.

The 10 h.p. motor was evidently kept at full throttle, proved too powerful, and pushed the boat under a moderate wave. The boat swamped and could not be emptied.

After tipping the boat over, two men clung to the sides and the other climbed on to the keel and paddled with the one remaining oar. As they could make no progress, they decided to swim for the beach. *All had lifejackets*, although Higgins had to put his on in the water.

My wife and I saw the boat swamp and immediately contacted the nearest coastal radio station, giving full details. My wife drove around the coast to get assistance, but only one other person was out and he came back with her. During this time I alternately flashed a boat on the horizon (no reply) and also to the swimming men to let them know that their plight was seen.

Eventually the men gained the rocky coast, and first ashore was Mr Higgins, who climbed out unaided and then collapsed on the beach. Mr Johnson, of ———, who was with me, assisted Mr Heath while I pulled out Mr Martin about 50 yd farther along the shore.

Martin saw a rock on his way in and tried to cling to it, but the waves washed him off all the time. Instead of swimming in with the waves he would go back each time to the rock.

Eventually he was pounded unconscious, so I swam out 25 yd and brought him in. I could not bring him right in because he was too heavy, but I brought him to shallow water and held him there until Mr Johnson had Mr Heath ashore, then he helped me to carry Martin up the beach.

We tipped the water from him and I administered resuscitation, which was successful.

After giving the men brandy and wrapping them in blankets, we put them in the car and took them to the station. We undressed them and rubbed them down and put them to bed. Hot, sweet tea was given them and they all went to sleep. When they awoke they ate soup and solid food and at 7.30 p.m. went home to their own bach half a mile away. I went to see them next day and they were all well, except for muscular soreness, bruises, and small cuts. The boat and all gear was lost, but insured.

FOG SIGNALS

Probably one of the most efficient fog signals for a boat of small size to carry is an ordinary car horn worked from the battery. The horn should be so placed that the sound from it is not obstructed by masts, sails, or deckhouses. The sound should preferably project forward in your direction of movement. A long blast should be made at least once every minute. The louder the sound is, the better for yourself and others who will need to hear it.

Small vessels under oars or sail should use any noisemaking appliance. This may be a mouth whistle or a hand rattle or a metallic object which can be struck to produce a ringing noise. (The use of a bell is not recommended since this is used by vessels at anchor.)

It may be of interest for the small boat owner to know the signals made by larger ships, so that, in the event of being in a fog bank, he can tell the likely movements of the larger ships in the area. Here is and extract from rule 15 of the Collision Regulations, dealing with fog signals and the intervals at which they should be made:

"(c) In fog, mist, falling snow, heavy rainstorms, or any other condition similarly restricting visibility, whether by day or night, the signals prescribed in this rule shall be used as follows:

"(i) A power-driven vessel making way through the water, shall sound at intervals of not more than two minutes a prolonged blast:

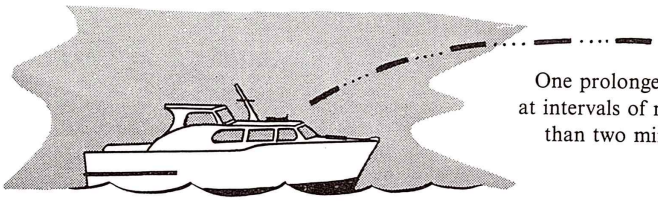
"(ii) A power-driven vessel under way, but stopped and making no way through the water, shall sound at intervals of not more than two minutes two prolonged blasts, with an interval of about one second between them:

"(iii) A sailing vessel under way shall sound, at intervals of not more than one minute, when on the starboard tack one blast, when on the port tack two blasts in succession, and when with the wind abaft the beam three blasts in succession:

"(iv) A vessel when at anchor shall at intervals of not more than one minute ring the bell rapidly for about five seconds. In vessels of more than 350 ft in length the bell shall be sounded in the forepart of the vessel, and in addition there shall be sounded in the after part of the vessel, at intervals of not more than one minute for about five seconds, a gong or other instrument, the tone and sounding of which cannot be confused with that of the bell. Every vessel at anchor may in addition, in accordance with rule 12, sound three blasts in succession, namely, one short, one prolonged, and one short blast, to give warning of her position and of the possibility of collision to an approaching vessel:

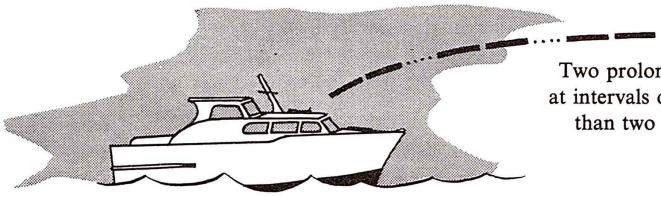
"(v) A vessel when towing, a vessel engaged in laying or in picking up a submarine cable or navigation mark, and a vessel under way which is unable to get out of the way of an approaching vessel through being not under command or unable to manoeuvre as required by these rules shall, instead of the signals prescribed in subsections (i), (ii), and (iii), sound, at intervals of not more than one minute, three blasts in succession, namely, one prolonged blast followed by two short blasts:

FOG SIGNALS BY POWER-DRIVEN VESSELS OF LESS THAN 40 FT IN LENGTH



One prolonged blast at intervals of not more than two minutes.

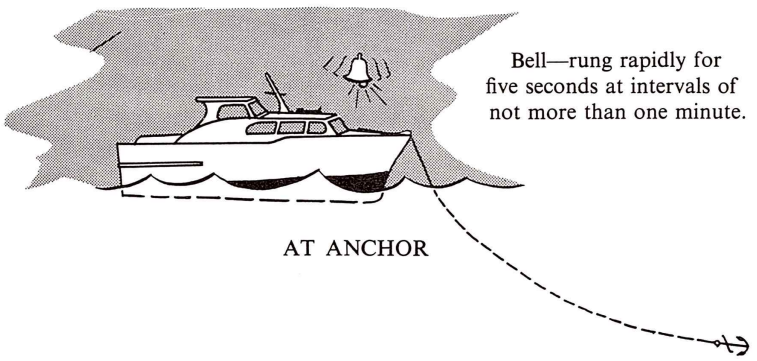
MAKING WAY THROUGH THE WATER



Two prolonged blasts at intervals of not more than two minutes.

ENGINES STOPPED, NOT MAKING WAY THROUGH WATER

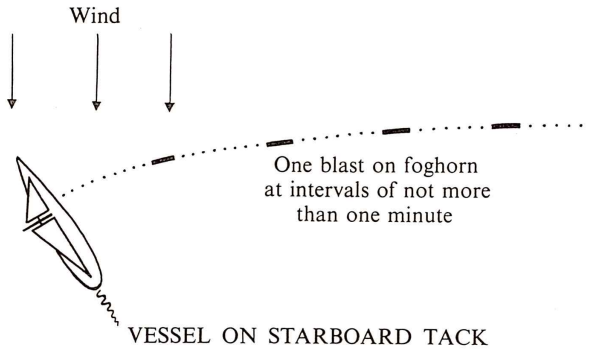
N.B. These signals may be substituted by some other efficient sound signal at intervals of not more than one minute.



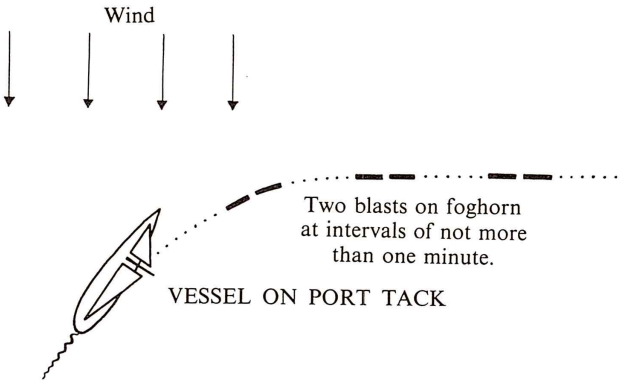
Bell—rung rapidly for five seconds at intervals of not more than one minute.

AT ANCHOR

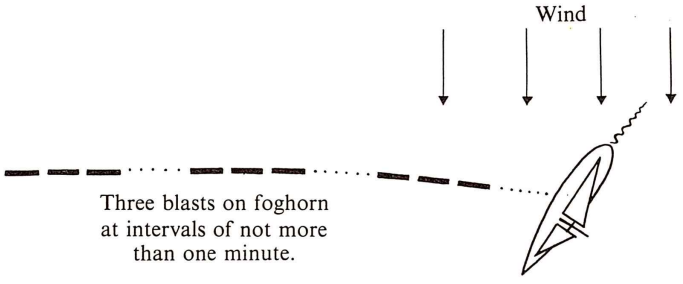
FOG SIGNALS BY SAILING VESSELS



VESSEL ON STARBOARD TACK



VESSEL ON PORT TACK



VESSEL WITH WIND ABAFT THE BEAM

"(vi) A vessel towed; or, if more than one vessel is towed, only the last vessel of the two, if manned, shall, at intervals of not more than one minute, sound four blasts in succession, namely, one prolonged blast followed by three short blasts. When practicable, this signal shall be made immediately after the signal made by the towing vessel:

"(vii) A vessel aground shall give the bell signal and if required the gong signal prescribed in subparagraph (iv) and shall in addition give three separate and distinct strokes on the bell immediately before and after each rapid ringing of the bell:

"(ix) A vessel of less than 40 ft in length, a rowing boat, or a seaplane on the water, shall not be obliged to give the above-mentioned signals, but if she does not, she shall make some other efficient sound signal at intervals of not more than one minute."

Precautions to be observed in fog

Although the sounding of a fog signal helps to make your presence known in fog or thick weather, it has been found that the projection of these signals can play strange tricks. Depending on the wind and the thickness of the fog itself, sounds often appear to come from an entirely different direction than from the vessel making the signal. You should *never* assume that you have definitely established the position of another vessel. This effect has been known for a long time, and rules have been drawn up to establish some form of conduct for all vessels in fog.

Obviously, bowling along at full speed would be hazardous – there may be no time to stop when the other vessel appears. This could be a disaster. The rules require all vessels to proceed at a moderate speed during fog. "Moderate speed" is regarded as "speed at which a vessel can bring herself to rest in half the visibility". What happens, you may ask, if visibility is nil? Well, you would be considered adequately cautious if you were *just moving* through the water. Circumstances may alter this slightly. Supposing you were in restricted waters and being affected by tide – then naturally you must safeguard your boat by maintaining speed to stop going aground.

One strict rule is given – Rule 16 – in fact, it's the only rule where explicit engine action is required. "A power-driven vessel hearing, apparently [note 'apparently'] forward of her beam, the fog signal of a vessel the position of which is not ascertained, shall, so far as the circumstances of the case admit, [this makes allowance for the action of tide as mentioned before] STOP her engines and navigate with caution until danger of collision is over."

The purpose of this rule is twofold: (1) Stopping engines will *slow* down the rate of approach (don't forget a boat keeps moving after the engines are stopped); and (2) Stopping engines will leave your boat quiet – much better for listening and identifying.

Don't take chances in fog. Remember, if you collide and people end up in the water, the fog around you makes searching and rescue extremely difficult.

LIGHTS TO SHOW

When experience has been gained in smaller boats your navigation may have improved somewhat. Perhaps you have now invested in a larger craft and may be sailing at night. Or in any event you may, by trick of wind, or tide, be kept from your "home" mooring until after sunset. What lights do you have to carry?

(See page 70)

Mast Light – to be visible 3 miles at least.

Side Lights – to be visible 1 mile at least.

Stern Light – to be visible 2 miles at least.

Mast light to be carried as high as possible preferably not less than 9 ft above the gunwale but in any case not lower than 3 ft above the side lights.

The side lights may be placed together for economy to make a combined lantern, with one bulb.

Care must be taken that part of the light does not show across on the wrong side. The coloured lights in the lantern should be seen clearly at 1 mile range.

Sailing vessels of less than 40 ft in length should carry the coloured side lights or the combined lantern. They do not carry the white mast light, but must still carry the stern light. It may not be possible to fix the combined lantern in the boat, so it should be kept ready and used when another vessel approaches with a likelihood of collision. Care should be taken that the coloured lights are seen on their respective sides *only* and over the proper arc.

This arc is important. Simply showing a red light over the whole port side, although a good indication, may tend to confuse an experienced navigator. Putting it simply and briefly, an officer on watch on a larger ship makes use of this arc in calculating approximately how the other vessel is heading. If he sees another vessel ahead not showing her side lights he knows at once that he is the overtaking vessel and it will be his duty to keep out of the way if risk of collision exists. (*See* Rule of the Road: rule 24.)

A vessel with her sails up, but proceeding on her engines should show the lights for a power-driven vessel. In this instance you must see that the white mast light is not obstructed by the sails. The best place would be at the top of the mast.

For the smallest of rowing boats and sailing boats special provision is made. All they need to carry is an electric torch or lighted white

lantern, which must be kept handy and shown in sufficient time to prevent collision. Flashing the light on the sails makes it seen more easily.

At anchor

Should you decide to come to anchor in some position where there may be passing traffic the rules are simple. All that is required is an "all round" white light to be shown from the forward part of the vessel. Its range is to be at least 2 miles.

FLAGS

(See page 67)

The single flag hoists are shown when an urgent or at least important and often used signal is sent.

Hoists of two flags (the upper one is always read first) are also used to send urgent or important messages.

When three or more flags are hoisted together on one halyard (rope) the meaning can be found only by looking into the international code book, at the approprate place for the signal, which is listed alphabetically.

Each ship is given a code group of four letters or a combination of letters and numbers which is her "numbers" and used for identification purposes, both for visual and radio signalling. The signal letters given to New Zealand registered ships are contained in the *New Zealand Nautical Almanac*.

Diver's Flag

Underwater divers show a distinctive flag on their attendant boat. See page 67. Should you see a flag like this, keep well clear, or, if you are already too close, slow down and keep a good lookout for surfacing divers.

It should be pointed out that the showing of this flag is a practice adopted in New Zealand waters, and that if you are in waters frequented by coastal or overseas shipping you might come across a vessel showing the international signals described on pages 114 to 118.

National Colours

The proper national colours for a New Zealand ship (the term "ship" embraces privately owned yachts) is the red ensign usually worn by merchant ships registered in the United Kingdom, with the addition on the fly thereof of the Southern Cross as represented by four five-pointed stars. The fly is the free-flying half of a flag. The halliards half is known as the "mast" or "hoist" side.

These colours must be hoisted on a signal being made to a yacht by a warship and when entering any port in a foreign country. Ships over 50 tons must hoist them when entering or leaving any port.

AIDS TO NAVIGATION

Buoys *(See pages 68–69)*

Buoys are used to indicate the channel which a vessel should take to keep in deeper water. For small boats they are an indication of the shape of the fairway, but in most cases smaller boats can navigate safely outside the buoyed channel.

Note: **On no account must yachts or pleasure launches obstruct fairways used by larger ships, either by anchoring in them or navigating across them.**

On coloured inset is shown the standard system of buoyage adopted by most countries. This standard system is in effect in New Zealand, but for a time yet buoys of an older system may be encountered. Always consult your chart. In most cases buoys and beacons are not only coloured but numbered and can be identified quite easily.

Buoys are described as being "port hand" or "starboard hand" from the point of view of a vessel entering a harbour or going in the direction of the flood tide. This stands to reason because, if deep water lies to one side of a buoy, a buoy passed on the starboard hand by a vessel proceeding in one direction must be passed on the port side going in the other.

Buoys may have lights fitted on them. Details of colour and number of flashes are too numerous to be contained in this book. In general, port-hand buoys give red or white flashes, starboard-hand buoys give white flashes and wreck buoys give green flashes.

Readers requiring details should obtain the Marine Department publication "System of Buoyage and Beaconage for New Zealand" from any Marine Department shipping office, or Marine Department Chart Depot. (See Publications, page 99.)

Beacons

Whereas buoys float on the surface attached to a mooring on the sea or lake bottom, beacons stand upright amongst the rocks and are firmly secured to them. Beacons are more common than buoys around the New Zealand coast, the reason being that they require less maintenance and are particularly suited to most areas in this country where rocks and reefs are the principal dangers.

Frequently the dangerous reef or rock is obvious in its direction from the beacon, and in most cases the boat skipper who carefully reads his chart has no difficulty in keeping to the safe side. Beacons with a red *can* or "T" topmark are to be passed on the port side (entering a harbour) and beacons with a black *diamond* or triangle topmark are to be passed to starboard.

Beacons may also be lighted. Marine Department and harbour authorities are continually improving the safety of navigation by means of new beacons marking navigational hazards. Notice of their erection is given in Notices to Mariners.

Leading Beacons

These keep a vessel to a straight and safe course when entering a harbour. Two beacons or lights are in line and separated by a few hundred (or less) yards. A vessel approaching the harbour sees one light behind the other and proceeds toward them. If the lights appear to separate the boat is wandering off the safe line and should be brought back on to it again. At a certain moment the vessel leaves the leading line and proceeds to her mooring.

Small boats may use these leading lights, *but must not anchor* with them in line or nearly in line. Large ships must have priority to keep on the line at all times.

Mooring to buoys and beacons

Boats and yachts must not tie up to a beacon or a buoy for fishing or any other reason. You should always keep clear of them, respecting them as marks of safety. Never moor your boat too close and obscure them from larger vessels.

Lighthouses

Many lighthouses are scattered around our coasts and their function is known to almost everybody. If two lighthouses are situated close together they can be differentiated during darkness by observing the different periods of flash which they send out, or by the colour of the light.

One lighthouse for example may show two flashes every 10 seconds, while the other shows a long flash every 30 seconds.

ELECTRONIC AIDS TO NAVIGATION

Radio beacons

These beacons are placed ashore and transmit radio waves on a given wavelength. Some operate during fog and darkness only, but all will operate on request. By means of a direction-finding receiver aboard your boat you are able to pinpoint the direction of the beacon. By finding the directions of two radio beacons suitably spaced you can find your position.

Details of New Zealand radio beacons are found in the N.Z. Nautical Almanac for the appropriate year.

Echo-sounding equipment

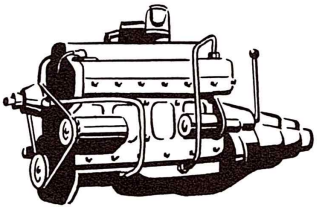
By projecting a high-frequency sound wave in pulses and measuring the time taken for each pulse to reach the sea bottom and return to the boat, this instrument gives the exact depth of water at a glance. Depths can be recorded on paper or flashed at the appropriate mark on a circular scale.

Radiotelephone equipment

This offers ship to shore (or ship to ship) communication. Its purposes are many and obvious. Costs of radiotelephone apparatus are steadily falling and for extended cruising it really is a "must" as a means of obtaining assistance when in danger.

MECHANICAL AND SAFETY TIPS

Motor boating is highly popular in New Zealand. For the sake of economy some boat owners prefer to fit engines themselves. In most cases a thorough job is made with an engine properly adapted for marine use. However, cases arise where an old car engine has been fitted and roughly adapted "to drive a propeller". We cannot condemn this practice too strongly. Once again one cannot help feeling that some boat operators assume that their boat is simply a car capable of moving on the water.



A motor boat is not a car. Service stations spaced at frequent intervals along the road take care of the normal needs of the motorist for petrol, oil, water, air, and breakdown assistance. Small petrol and oil leaks drop harmlessly to the road surface, and the fumes are rapidly blown away. If the car stops it is only necessary to coast or be pushed to the side of the road. Once afloat, the amateur finds none of these safeguards. The boat has no brakes and when put astern will not travel in a straight line. The wind, unbroken by buildings and hills, seems to blow much more strongly and a mysterious force called "tidal current" carries the boat in unpredictable directions. Petrol and oil from leaks accumulate in a dangerous, inflammable puddle floating on the surface of the bilge water in the bottom of the boat.

The rate of consumption of fuel, fairly well known for a car, becomes highly variable in a boat. If reserve capacity is limited, as in most small boats, the boat owner may find himself out of petrol and in an extremely dangerous situation. Wind, sea, and tides directly affect this variation of fuel consumption.

The average well built small boat has many safety devices, and familiarity with them may avert serious trouble. Many small boats have a bilge pump running continuously off the main engine. If suction is kept clear, packing snug, and the pump primed, it will keep the bilges free from an accumulation of sea water, petrol, and oil. Some boats have hand pumps which are portable and handy for pumping out

pockets between vertical bulkheads (partitions) and frames. Some have an eductor, which depends on a jet of high velocity water lowering the pressure on a suction line, thereby "sucking" water from the bilges. Eductors must be watched continuously while in operation because they can easily flood the bilge if check valves stick open and the water backs into the suction line.

Since service stations are non-existent afloat, a thorough familiarity with working parts of the motor boat is vitally important. All wiring must be well insulated and protected from chafing. Watertight light sockets must be kept watertight. The battery should at all times be well charged and the generator frequently checked to make sure that it is charging properly when the engine is running. Frequent starting, operation of an electric hot-plate or radio, etc., while drifting, tend to run down the battery, and inability to restart the engine can result.

The cooling system of the engine is important. Sea intakes and discharges must be free from sea growth, and strainers kept clear. Corrosion inhibitor should be used to protect the water side of the engine if it is fresh-water cooled. Should the motor run hot due to insufficient cooling, it may stall or catch fire.

Oil used in the engine should be of the proper grade and weight as specified by the manufacturer. Filters should be frequently changed to ensure clean oil.

Connections on the suction sides of the fuel, lubricating oil, and water pumps must be tight to prevent air binding, with consequent engine trouble.

Check over steering cable runs and turnbuckles. Learn how steering is accomplished and how to take slack out of cables or how to replace a broken cable in an emergency.

The vital ignition accessories, such as spark plugs, ignition wires, coil and distributor, must be kept clean and dry at all times. Learn how to clean and gap spark plugs and check breaker points, adjusting to proper clearance.

To recapitulate a few major points

1. **Don't start** your engine if fumes of petrol are present. Run a blower and check the bilges. Check for petrol leaks and correct them. Air out the bilges.
2. Keep the battery charged and the generator in good working order.
3. Make sure that you have plenty of fuel and keep a running check, at reasonable intervals, on the amount remaining throughout your voyage. Allow for increased consumption due to any unusual sea, wind, or tide conditions. Lowered visibility may also force you to take a longer and safer route than one you might use in clear weather.

In rough weather you may find that the rolling of the boat mixes the fuel with air bubbles and, even though about one-third of the tank remains, you can't run the motor steadily. You should know this danger point. Baffles in the tank help and spare fuel carried in a safety can may be a godsend. Sometimes dirt clogs the petrol line and you should know how to change filters, disconnect the petrol line and blow it without losing much petrol into the bilges. Any petrol that spills must be promptly wiped up, of course, and the compartment fully ventilated before restarting the engine.

4. Steering cables should be bronze wire (non-magnetic) to avoid causing excessive deviation of the magnetic compass. Keep sheaves and fairleads well lubricated and inspect the cable for frayed or worn parts. Replace when wear is such that cable may part.

Indications of electrical trouble are dim lights, weak-sounding horn and the ammeter showing discharge when engine is running at moderate speed. Timely location and correction of a difficulty such as a short circuit or worn brushes on a generator, for example, will amply repay you for your trouble by ensuring reliable, steady running of your engine. You must also take the other precautions listed above in regard to fuel supply, cooling water and pumps, etc.

Precautions to be taken before starting up

Open all doors and vents, etc., leading into or out of the engine compartment to allow full ventilation before starting up.

Check oil levels.

Open cooling water valves.

Check belt drives for pump and generator.

Enclosed engines MUST be petrol-fume free and well ventilated before ignition is switched on.

It is advisable when an engine has had no use for some time to turn it by hand before starting.

In outboard motors, ensure that lubricating oil has been added to petrol where this is necessary.

Ensure petrol switch cock is "on".

Ensure air intake valve (if one is fitted) is open on petrol tank.

If engine does not start

Spark plugs or distributor points may require cleaning.

Leads may be wrongly connected.*

Check that the petrol switch cock is open.

Check that the air intake on the petrol tank is open.

There may be water or too much lubricating oil in the petrol. Drain tank and refill.

Fuel lines may be choked. Check that the petrol reaches carburettor. If it doesn't disconnect the fuel line and clear by tapping or blowing.

Carburettor jets may be choked. Remove and clean; also clean float chamber.

Cylinders may be flooded with petrol due to many attempted starts. This is one of the commonest faults of the operator. Sit down and leave the motor for a few minutes so that the petrol can evaporate.*

Look for a defect in condenser or coil, bad battery terminal connections, loose spark plugs, or faulty plug joint.

There may be poor compression in any cylinder, which may be due to leaky cylinder head joint, valves not closing, or broken piston rings. These are serious faults and cannot be remedied with the tools available on board.

If engine stalls

It may be idling too slowly.

The fuel mixture may be too rich.

It could be for any of the reasons given above for failure to start, except those marked with an asterisk so *.

Read the maker's handbook.

Further precautions

Carry a spare cord for starting outboard motors.

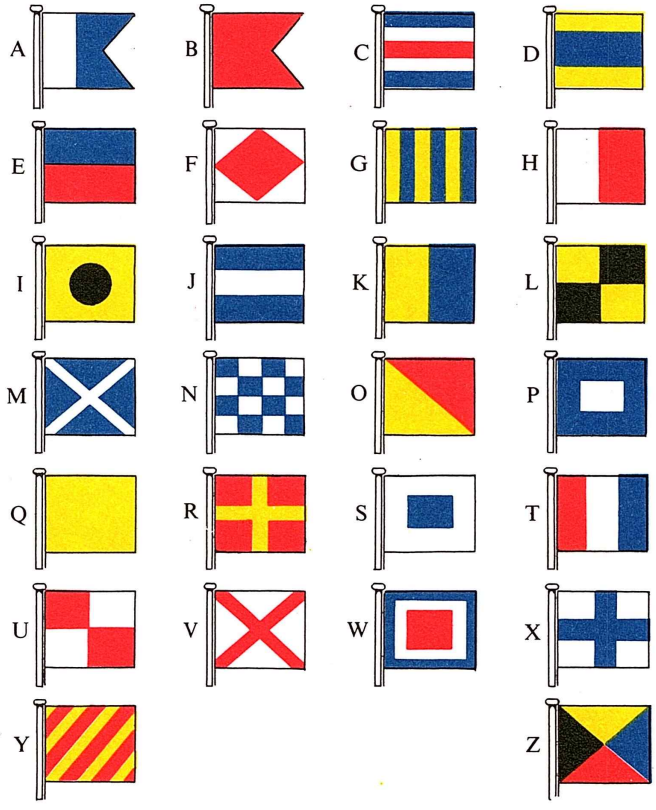
Carry a tool kit. Screwdriver, wrenches, pliers, knife, flashlight, insulation tape, spare spark plugs (wrapped), spare wire, and service manual would be adequate for most small breakdowns in craft with outboard engines.

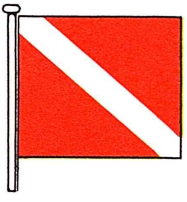
Give the motor or engine a thorough test before going out for the day

If the engine overheats due to cooling-water blockage, do not pass cold water through the engine block when the blockage is remedied unless it is thoroughly cool, otherwise the cylinder head is liable to be cracked.

Keep a log of hours run, and have your engine serviced regularly.

CODE FLAGS





DIVER'S FLAG

(Indicates Diver below or in vicinity of Boat.)

STANDARD SYSTEM OF BUOYAGE

Port Hand Buoys (canshaped)

Starboard Hand Buoys (Conical shaped)

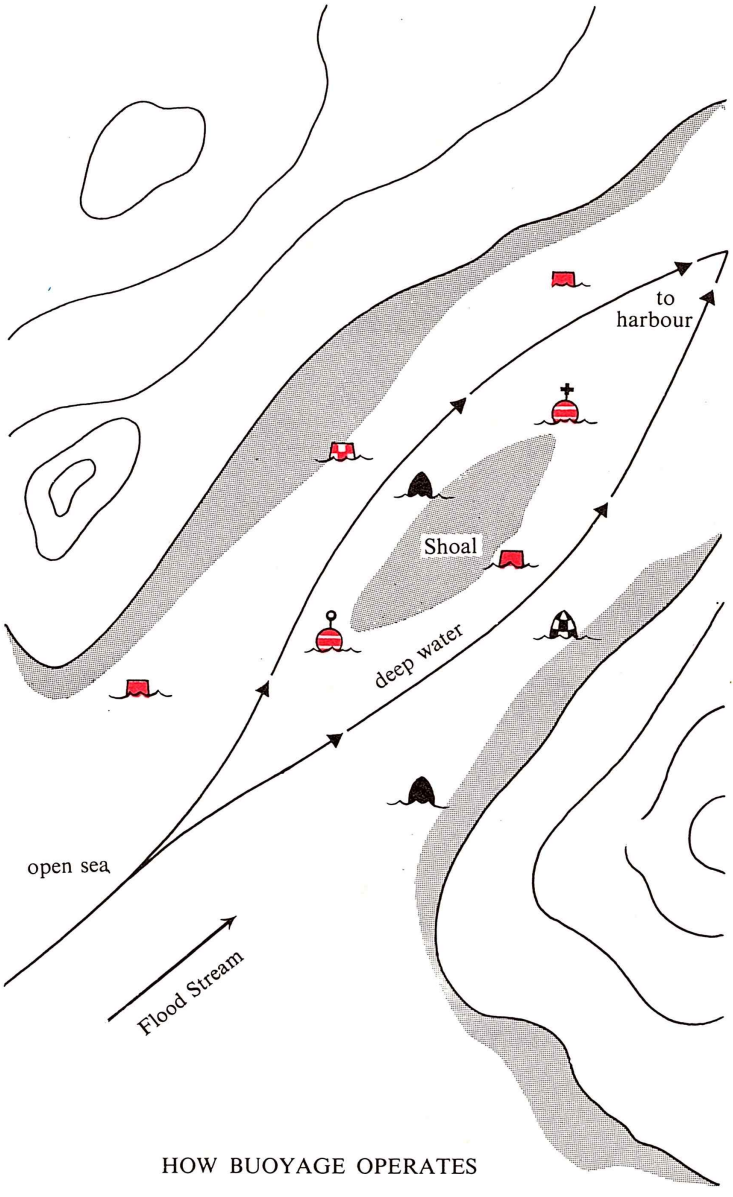
Middle Shoal Buoy also in black and white
Spherical shaped
Pass either side

Landfall or Fairway Buoy
Pass either side

Wreck Buoy (Green) Can, Conical or spherical
Shaped as required.

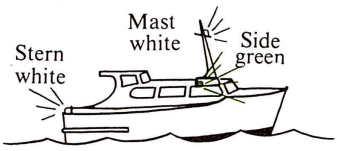
Isolated Danger Buoy
Pass either side

OPTIONAL TOP MARKS ARE SHOWN

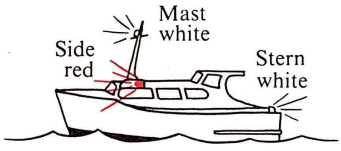


HOW BUOYAGE OPERATES

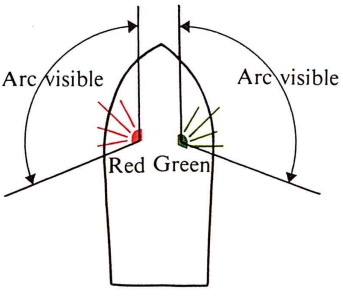
POWER DRIVEN VESSELS OF LESS THAN 65 FEET

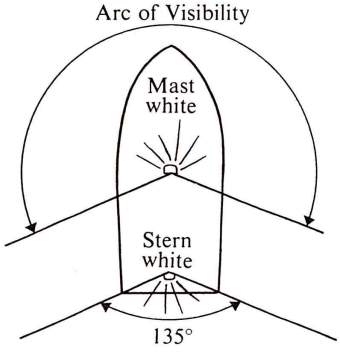


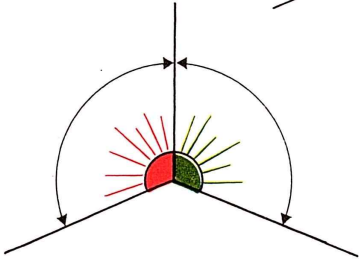
STARBOARD SIDE



PORT SIDE







COMBINED LANTERN

EMERGENCIES

At some time or another emergencies do occur, even on well looked after boats. Emergencies never seem to conform to pattern and no one can lay down definite rules about what to do in certain sudden circumstances.

If possible you should try to prevent the emergency arising by avoiding taking unnecessary chances. The following comments and hints on fires and accidents lay out a general pattern which you should adjust to suit your boat.

"Think ahead" is a good skipper's motto. Imagine how you would deal with a situation which developed suddenly and which could imperil your boat and perhaps your life.

Here is an example of how a launch became a total loss through fire. The engine had been cleaned down with petrol and the owner, being a non-smoker, and not considering the possibility of fire, went ashore to fetch some equipment. He had gone but a few yards when the launch burst into flames, and efforts to extinguish the fire were unsuccessful. Some loose tools had been left on a ledge above the battery in the engine room and, when the owner stepped from the launch into his dinghy to go ashore, the launch rocked. It is likely that one of these loose tools fell on to the battery and caused a short circuit. The resulting spark ignited the petrol fumes being given off from the engine.

In another case, when a launch was severely damaged by fire, the cause was traced to a faulty exhaust system. The launch had been re-engined and, in order to adapt the previous exhaust-pipe arrangement to suit the new installation, a piece of 3 in. diameter rubber canvas-reinforced hose was used to connect the old exhaust with the new engine manifold. This piece of hose was led through the wooden partition behind the engine. Failure of the engine-cooling water system, which also cooled the exhaust, resulted in due course in the overheating and destruction of the canvas hose and the discharge of uncooled exhaust gases under the cockpit seat which was boxed in. The vessel's timbers in the vicinity of the exhaust soon reached ignition point and the resulting fire spread rapidly throughout the cockpit. Before being extinguished, the conflagration destroyed most ot the topsides, deck, and cockpit roof from midships to the stern.

The above two cases are cited as examples of the ease with which fires can be caused in small launches. Although the provision of fire extinguishers can quell a small outbreak if tackled promptly, fires caused

by petrol and oil fuel often spread so rapidly and generate such intense heat that it is difficult, and, at times, impossible to use the small extinguishers normally carried on launches or yachts to full effect. You should therefore be at all times on your guard against fire and should take all precautions to prevent a fire from starting. The possible loss of a launch or yacht by fire is a heavy price to pay for what may at first appear to be an insignificant action.

Fire afloat

Fire on the water can be a most terrifying experience. Your surroundings are burning and you are faced with nowhere to go except into the water. In a sense you are trapped.

Keep in mind that most fires shouldn't happen. If you look after your boat well, stow your gear properly, and keep the bilges clean you will have gone most of the way to avoiding a fire. You should always be on guard – whenever conditions arise which might contribute to a fire you should correct them at once.

Even in the most efficient boats, fires are always a possibility and do occur. All of us who plan to sail the sea or lakes should be foresighted in this respect. Fire-fighting equipment must be placed in suitable positions about the boat and should always be kept in good condition. In a small boat your fire-fighting gear may be limited to one fire extinguisher and a bailer; however, their handiness and condition could make the difference between safety and disaster.

Like other factors in boating it pays to think ahead about the action that you would take in case of fire. More can be done in the first minutes than in the following hours.

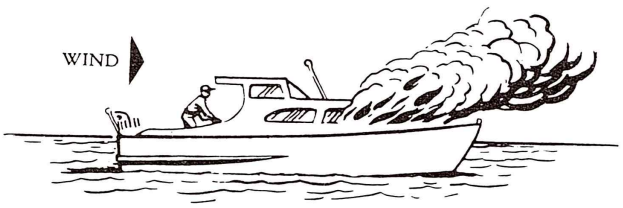
Fires are mainly extinguished by one of two methods, or a combination of both, namely cooling or smothering, or both cooling and smothering. Extinguishing agents such as dry chemical powder, carbon dioxide gas and foam smother and, to some extent, cool. They are most effective on oil or petrol fires because they can be directed at the base of the flames without the danger of scattering the burning liquid. Oil and petrol fires are known to be by far the most difficult to extinguish on board small boats.

Ordinary fires starting in mattresses or woodwork are best extinguished by plain and simple water. And you have plenty around the boat – this is another reason for having that plastic bucket or a metal bailer on board. Throwing burning materials over the side should not be overlooked.

If a fire occurs in a relatively confined space, the closing of hatches, doors, ventilators, and portholes will help in keeping the oxygen from

the flames. If it is in an engine space, shut off the fuel supply to the engine and, if you have had the good sense to install a fixed fire-fighting agent, you should discharge it.

You can help to fight the fire by manoeuvring your boat. The movement of the boat through the air and water fans the flames; stopping or reducing speed helps to reduce the wind effect. If smoke is blowing towards you from the fire, it is difficult to approach with your extinguisher. Turn your boat in the water so that the fire is more easily reached, being careful, however, not to put the boat in a position where the breeze helps to play the flames on to more inflammable parts of the structure. If the fire is aft, put the bow into the wind. If the fire is forward, put the stern into the wind.



Should you have immediate apprehensions about being able to control the fire, make preparations to abandon ship straight away – this includes wearing lifejackets (are they accessible?) and signalling for assistance by radio or some other means.

Fire extinguishers

You should carry fire extinguishers at all times and have them placed with some forethought so that they will be within reach. Have one handy to the engine room (but not inside it) and one aft or near the steering position.

Carbon dioxide and chemical dry powder are highly recommended for use aboard boats – be careful of the former since the gas is suffocating and will remain in confined spaces. Foam is also excellent, but in restricted spaces, such as the engine room of a launch, it has not the penetrating power of high-pressure smothering gas.

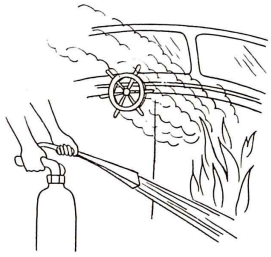
Carbon tetrachloride is effective, but gives off a gas which is poisonous and is not recommended. Carbon tetrachloride is a poor conductor of electricity and may be used with safety on switchboards and batteries, etc.

Soda acid type fire extinguishers are cumbersome aboard a boat and are almost useless against petrol fires.

How to use your portable fire extinguisher:

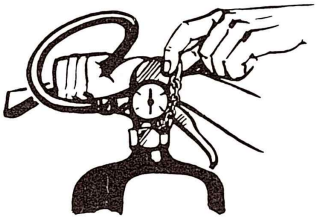
CARBON DIOXIDE

Pull pin



Point at base of fire and pull trigger

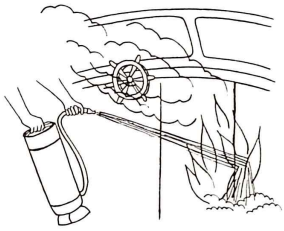
DRY CHEMICAL (stored pressure)

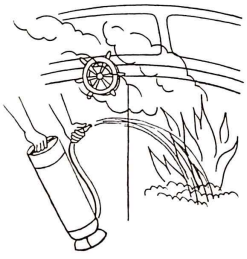


Pull pin and free nozzle

Point directly into fire and squeeze lever

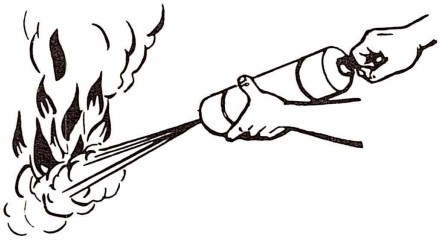
FOAM





Invert at scene of fire and bounce discharge off sidewalls or arch stream onto surface

VAPORIZING LIQUID (pump)



Unlock by turning handle

Discharge at blaze or bounce off sidewalls by pumping

DRY CHEMICAL (cartridge operated)

Pull pin and free nozzle

Point directly into fire and pull trigger

A good scheme is to take one of your extinguishers ashore – start a petrol fire in a safe place and have a practice run. (It's too late to read the instructions when a fire has started.)

Don't forget to refill the extinguisher!

Proper maintenance of your extinguishers is as important as having them there in the first place. Sometimes nozzles get clogged or hoses cracked – these should be fixed at the first opportunity. Pressure gauges, if fitted, may indicate low readings – see that the extinguisher is charged up. Locking pins and sealing wires should be checked to ensure that no one has inadvertently set it off.

In this last respect, keep extinguishers out of young children's reach.

Causes of fire

The common causes of fire on board small craft are:

Engine backfiring in vapour laden air.

Electrical short circuit in vapour laden air.

Naked flame in vapour laden air.

Hot exhaust pipe igniting surrounding wood.

Combustion stove igniting surrounding wood.

Spontaneous combustion of oily rags in badly ventilated compartments.

Static electricity during refuelling.

Battery charging.

Points to prevent fire or explosion

Do not use petrol for cleaning purposes. Use clean cotton rags for cleaning. Dispose of dangerous greasy rags.

Carburettors on petrol engines should be fitted with wire-gauze covered drip trays. Flame traps should be fitted in the air intakes. Clean the drip trays before starting the engine.

Properly ventilated bilges and engine rooms are absolutely essential to the safe operation of any motor launch or yacht. Petrol vapour and cooking-gas vapour are both heavier than air and will accumulate in the lowest parts of the launch. Ventilation trunks should be led right down in the bilges to ensure that any vapour collected there will be discharged to the atmosphere.

Before starting up a petrol engine, open all doors and vents, etc., leading into or out of the engine compartment and allow the space to ventilate for at least five minutes before starting up.

Fit a cover over the batteries so that tools or other metal objects cannot fall on to the terminals and cause a spark.

Do not strike matches, smoke, or use kerosene or other open-flame lamps inside the engine room.

Allow only safety matches to be used on board. Non-safety matches and cigarette lighters which can spark if dropped should be prohibited.

Fuel piping in launches should be of steel or heavy-gauge copper and care taken to ensure that the piping is not subject to vibration which could result in fracture. Plastic tubing should not be used for fuel lines.

Inspect fuel tanks frequently and test them periodically to ensure that they do not leak. Where leaks have been caused by corrosion of the tanks, do not try and patch things up. Replace the tank – it is cheaper than replacing the launch or yacht.

Filling pipes for fuel tanks should be led from near the bottom of the tank to the open deck outside of cockpits and coamings so that any spillage of fuel will run overboard and not down to the bilges. Be sure the filling pipe covers are a good fit.

A vent pipe should be fitted to each fuel tank of the same size as the filling pipe and should be led from the top of the tank to the outside of the hull with the outlet covered with wire gauze.

Do not overfill fuel tanks. Leave some space for expansion of the fuel.

Fire extinguishers should be kept outside the engine room in places where they can be reached from the open deck, so that in the event of a fire the extinguishers are accessible and the fire can be fought from a safe position.

Make sure engine exhausts and uptakes are properly insulated and are not liable to scorch or set fire to nearby woodwork.

Petrol or kerosene stoves are not recommended for use in boats. Gas stoves should be kept clean and checked frequently to see that there are no leaks in the gas lines. When not in use, be sure gas stoves are properly switched off (see opposite page).

Check the electrical wiring periodically and replace any frayed or worn electric cables, broken plugs, and lamp holders, etc.

Generators and all switches should be as far as possible above the bilge. Air-cooled generator sets should not be used below decks. Do not overfuse electrical circuits since wire will overheat. Oil-soaked insulation rapidly deteriorates.

Keep the boat clean and free from inflammable rubbish such as dirty waste, rags, loose oil and grease, etc.

Finally, remember that most petrol and gas leaks start in a small way and only constant and thorough inspection can reveal them before the danger stage.

Cooking stoves

Cylinders of gas are supplied throughout New Zealand for the use of caravans and boats, etc., in cooking stoves. In the main, these gases are from liquefied petroleum and consist of butane, propane, or a mixture of both. As they are heavier than air a leakage would cause the gas to accumulate in the lowest place which would be the bilge. A mixture of this gas and air would, under certain circumstances, cause an explosion if in proximity to a naked flame or light – or even the electrical spark in a motor or generator.

From the information obtainable, it seems that the danger of an explosion can become very remote if the owner of a launch or yacht takes the following precautions:

The gas cylinder should be securely fastened on deck in an upright position. If a leakage of gas does occur from the cylinder valve, it will be blown harmlessly away.

A flexible wire cord plastic tube should be used between the cylinder and the cooking apparatus. Rigid copper tubing is liable to fracture under vibration.

When not cooking, turn the gas off at the container valve, not only at the cooking range.

If a vessel has been out of commission for some time, the owner should satisfy himself that there is no accumulation of gas in the bilges before starting the engine.

Gas detectors

There are on the market vapour detectors which detect the presence and accumulations of explosive gases. In some if the concetration of gases is too high an alarm bell goes off or the apparatus can be installed in such a way as to prohibit the switching-on of the engine until the detector is also switched on. The use of some such device or indicator is highly recommended by the Marine Department.

Fuelling

Greater care should be taken when fuelling your boat than when putting petrol into your car. In a boat the circumstances are changed. Spilled petrol gives off dangerous vapours which find their way down to the bilges waiting to be ignited by a spark or flame. Do you know that a cupful of petrol vaporised and combined with air has the same explosive force as 5 lb of dynamite?

Remember, when fuelling, to:

Have your boat secured at the jetty.

Allow no smoking, no flames of any kind.

Have no red-hot stove plates.

Have a filled fire extinguisher handy.

Close all portholes, hatches, and doors.

Shut down all electrical equipment.

Check main electrical switch is in "off" position.

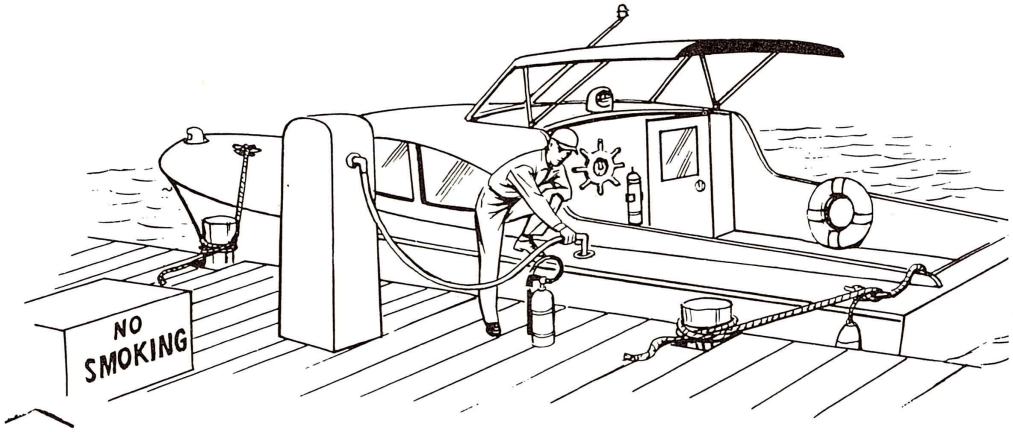
When fuelling is finished open up the portholes and hatches again and run the bilge ventilation blower if you have one for about five minutes before starting the engine. Before pressing the start button, check the bilge to find out if there is any smell of petrol. If there is, don't attempt to start.

Owners who carry a reserve of petrol in drums should make frequent and regular inspections to make sure that they are in perfect condition. Ordinary 4-gallon tins are not suitable and are a definite danger hazard. All loose fuel should be carried above decks.

Outboard motors may be fuelled at sea or on the lake, but the motor must be shut off and an adequate filler funnel used.

Do not use cigarette lighters or matches for searching in lockers or bilges. Use an electric torch.

Remember – Spilled Petrol Means Danger



Ventilation

Bilges should be adequately ventilated. A four-duct ventilating system with intakes aft and discharges forward would be a good system. The discharge pipe should come from a low point in the bilge and the inlets may lead to upper portions of the compartments. A rough guide to the size of each ventilator in terms of length of the boat is given below:

Boat Length	*Vent. Pipe Diameter* In.
Up to 20 ft	3
,, 25 ft	3½
,, 30 ft	4
,, 35 ft	4½
,, 45 ft	5
,, 50 ft	5½

FIRE CASUALTIES

The following recent fire casualties which occurred in New Zealand waters will serve to illustrate the fact that the foregoing recommendations are based on experience:

Fishing launch *Stella* – burnt out when a spirit stove overturned in a heavy swell off Waiheke Island.

Passenger launch *Romance* – burnt out in Auckland Harbour due to faulty exhaust insulation.

Auckland trawler *Joan* – heavily damaged and sunk after severe internal explosion following striking of a match in the engine room.

Bluff fishing vessel *Rotahi* – wheelhouse ablaze, fire extinguished by shore-based fire brigade.

Havelock cabin cruiser *Ramillies* – violent internal explosion following an attempt to start the engine. Vessel burnt out and foundered.

Whangarei fishing boat *Sea Bea* – vessel washed ashore in bad weather and when blown over on her side burst into flames and was completely destroyed.

Dunedin cabin cruiser *Milady* – burnt to water's edge after a fire which started in the engine room. The engine had been cleaned down with petrol shortly before fire.

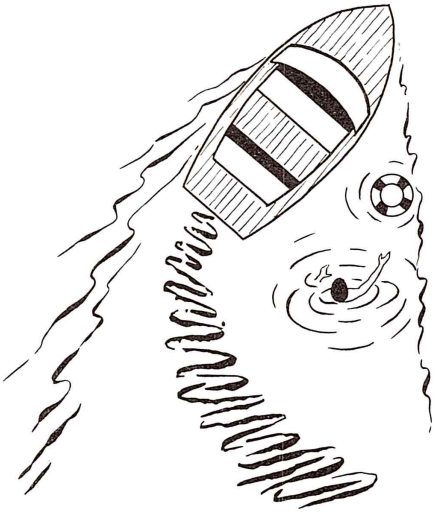
Cabin cruiser *Roamer* – violent explosion and fire following an engine backfire when being started. Vessel burnt out and foundered in Moncks Bay.

MAN OVERBOARD

This heading sounds as though the answer to it might be quite simple. "Turn the boat round and go back and pick him up." As easy as that. Most times it isn't difficult and will be done satisfactorily. However, the following points are worth remembering.

If the person or child is seen to fall over the side, turn the stern of the boat away from them as quickly as possible. It is possible that the propeller might touch them as the boat passes – enough to cause serious injury or at least enough to prevent them swimming.

So, if someone falls over on the starboard side, turn the bow to starboard; this will swing the stern clear of the man in the water.



Conversely, if the man falls over on the port side, turn the boat to port and, as before, the stern, with its dangerous screw, will swing clear.

If you own a large boat, the engines should be stopped immediately you see someone fall over the bow. This stops the suction into the propeller, which may drag the man towards it. Try, if you can, to make the stern swing clear at the same time.

If you have assistance then you can throw over something for the man to cling to until you can manoeuvre back to him. If you are alone, as soon as you can do so throw over a lifejacket or a floating cushion – anything that will float.

The head of a swimmer is difficult to see in choppy water, and your man may have been struck on the head and unable to wave or swim.

If there is anybody else with you, get them to keep an eye on the person in the water while you attend to the boat.

Once you are sure that the propeller will not affect the man in the water you can use the engines to approach him slowly. It is best to approach him slowly from leeward, so that you will not drift down on him. You should avoid bringing the boat near him too quickly. The best idea is to throw him a line and pull him towards the boat and then help him aboard. In small boats it is normally safer to bring him aboard over the stern. If he is unconscious or in difficulties another person should enter the water and assist him from there. The engine *must* be stopped while the man is boarding. (See page 52.)

Summing up:

Turn the stern away from him.
Stop engines simultaneously.
Throw him a lifebuoy.
When you are sure he is clear, approach him slowly, coming up into the wind.
Do not get too close too quickly.
Throw him a line.
Assist him aboard.

Be most careful, when bringing someone aboard from the water, that you don't end up in the same predicament.

If the victum is exhausted, never, under any circumstances, try and bring him aboard by yourself. Hold him above water if there are other boats around until you can get help. Should you be alone in a particular area it would be best to lash your man to the side and slowly make your way to the shore.

A rope fastened to the gunwale in loops along the outside of the boat could prove very handy for grabbing in capsize or man-overboard accidents.

Going aground

Most boats are built to withstand a certain amount of grounding and handling on the shore. The occasion may arise where your boat strikes ground and a rock or rocky projection staves in the bottom or side of your boat – perhaps because you hit while going at speed.

If this happens away from land your most important duty at first is to make sure your passengers are wearing their lifejackets and that no one is hurt. Start your bilge pump or set someone to bailing out the water inside the boat and at the same time survey the damage to see if refloating is advisable. Avoid the temptation of putting your engine in reverse and pushing your boat away from the rock without having done this. You may end up by sinking in deep water!

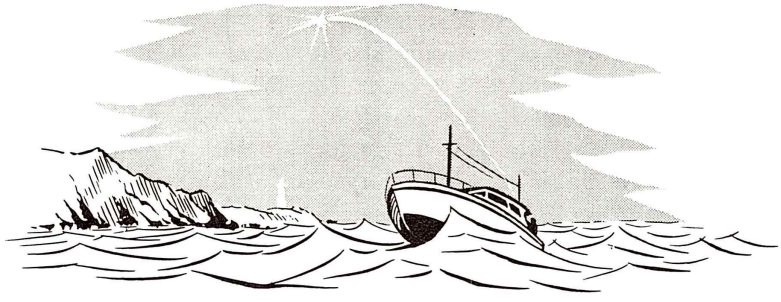
Once you are satisfied that the boat will float you may then push her off the projection. Someone may need to leave the boat to make it lighter or, if everybody changes position, she may slide off with the assistance of the engine. Avoid doing more damage to the hull.

A boat stuck on mud or sand can sometimes be freed by the passengers moving quickly from side to side of the boat, causing it to "rock" and break the suction by a cushion of water under the bottom.

A spare cushion or settee squab pushed into the hole (from outside) and tied with your spare line will keep the water from entering at too fast a rate so that you can gain on the intake with pumps or bailer.

Get back home direct. If in doubt, leave passengers ashore somewhere as soon as possible. If you have a radio, notify someone what has happened. Do not hesitate to ask for assistance.

SEARCH AND RESCUE



In New Zealand, boatsmen have the advantage of, if they wish it, quiet waters, lonely coves, and beaches. This also brings with it the problem of help reaching the individual who is in trouble.

In the United States, for example, the population warrants a complete coastguard system dealing with thousands of ships, launches, and boats, as well as aeroplanes. In this country a much smaller part-time force can be brought into operation at a moment's notice, but this small search force may have to cover an extensive area, which makes searching a prolonged business. If a distress message is properly sent out, or if the rescue forces know the route which the missing boat intended to take, the task is made much easier.

Briefly the arrangement for Marine search and rescue in this country is as follows:

Local incidents, such as a dinghy capsizing or a small boat drifting out to sea, are handled by the local authority which would be in most cases the police, but sometimes a harbour board. Action is taken by sending out rescue boats by the harbourmaster or a volunteer boat crew. Other resources may be used – for example, the local aero club might be able to help.

When the police feel that the case is bigger than they can handle on their own (probably a missing boat or missing persons), a telephone call to the appropriate officer in Auckland, Wellington, or Christchurch, brings an efficient organisation into operation. At the disposal of this organisation are RNZAF aircraft, commercial and club aircraft, ships, launches, fishermen, harbour boards, and people schooled in search procedure. Communication lanes are set up, with a central control over the whole operation.

Naturally the first things the Search and Rescue coordinator wants to know are – "What is the description of the boat?" – "Where was it going?" – "Are there any flares or signals aboard?" – "Do they have radio?", and other things of a similar vein.

Two things are needed more than others for speedy action to be taken:

(1) Boat's identity and description, and,

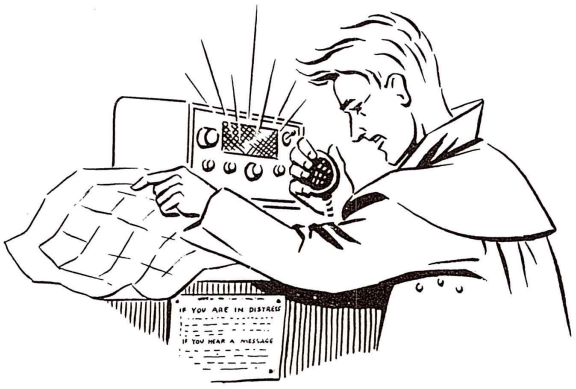
(2) Approximate position of boat.

That is why it is most important to let somebody know where you are going in your boat. You may think everything will be all right, but how can you possibly be sure? And it is better to be safe than sorry.

A form, called the "10-minute form" has been devised by the Marine Department for use by the skippers of craft intending to make an extended voyage. For your own safety, take 10 minutes off and fill it in before you sail. Copies are available from Police stations near the coast, Government Shipping Offices, Collectors of Customs and some Yacht Clubs. The information on a 10-minute form will not be used unless a relative or friend requests a search.

A copy of this form is shown on page 95.

Distress Signals



For larger boat owners who travel on longer voyages the benefits of carrying some sort of distress signal are many. In addition to a transmitting radio, distress flares and smoke signals are necessary.

The radiotelephone is now a compact piece of equipment and a most valuable aid. Coastal ships and shore radio stations at Auckland, Wellington, and Awarua (Bluff) listen on a frequency of 2182 kilocycles. There are also listening stations for hire-boat services and fishing parties, etc., which operate most of the day but generally on different frequencies (2045 or 2162 kilocycles). It pays to find out which is the closest station if you are in a strange locality.

The following is a copy of Marine Department Notice Series B No. 1A.

FOR DISTRESS AND IMPORTANT MESSAGES THERE ARE THREE CLASSES OF CALLS YOU MAY MAKE

DISTRESS

If in imminent danger and **immediate** aid required, use

MAYDAY

1. Switch to 2182 kc/s International Distress Frequency (any other frequency may be used if it is known that nearest station or ship is keeping watch on that frequency).
2. Say MAYDAY MAYDAY MAYDAY.
3. Say THIS IS—
   *.....(3 times).
4. Say MAYDAY *.....
5. Give your position.
6. State nature of distress.
7. State type of help required.
8. Give any other information which may assist rescue.
9. Listen on same frequency for acknowledgment.
10. If any other ship interrupts say SEELONCE MAYDAY.

EMERGENCY

If MAYDAY not warranted but urgency required for safety of ship or person, use

PAN

1. Switch to 2182 kc/s International Distress Frequency (any other frequency may be used if it is known that nearest station or ship is keeping watch on that frequency).
2. Say PAN PAN PAN.
3. Give name of station required (3 times).
4. Say THIS IS—
   *.....(3 times).
5. Give urgency message.
6. Listen on same frequency for acknowledgment.

SAFETY

If a message concerns safety of navigation or important meteorological warning, use

SECURITÉ (SAY-CURE-E-TAY)

1. Switch to 2182 kc/s International Distress Frequency (any other frequency may be used if it is known that nearest station or ship is keeping watch on that frequency).
2. Say SECURITÉ SECURITÉ SECURITÉ.
3. Give name of station required (3 times).
4. Say THIS IS—
   *.....(3 times).
5. Give safety message.
6. Listen on same frequency for acknowledgment.

IF YOU HEAR A DISTRESS MESSAGE

1. LISTEN CAREFULLY. If possible, write down the message and time.
2. LISTEN FOR AN ACKNOWLEDGMENT from a coast radio station.
3. If no acknowledgment heard—acknowledge.
4. Say MAYDAY RELAY MAYDAY RELAY MAYDAY RELAY.
5. Say THIS IS—
   *.....(3 times).
6. Give distress message as broadcast by vessel in distress.
7. Give assistance if possible. Advise coast radio station of what you are doing.
8. Continue to listen-in.
9. If other radio traffic interrupts say SEELONCE DISTRESS *.....

Unnecessary Traffic Should be Avoided at All Times

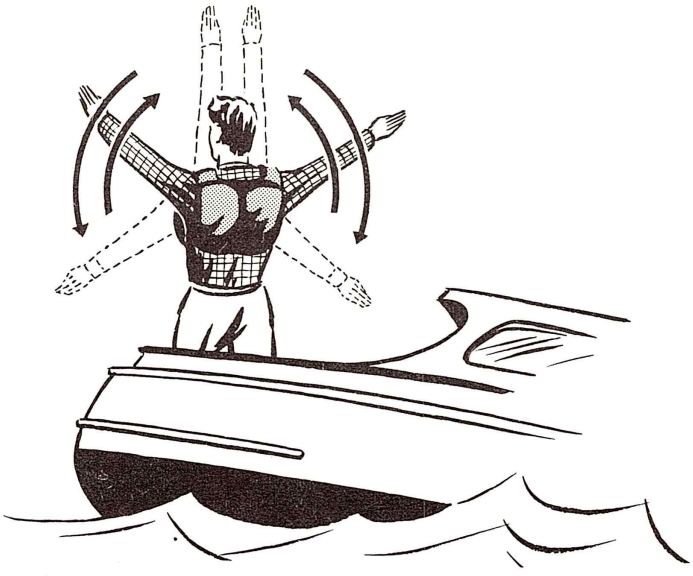
*Insert your Ship's name and call sign.

As visible distress signals to guide searching boats and aircraft towards you, smoke signals by day and red flares by night are probably the most effective. The smoke, generally a yellow or orange colour, is visible for a long way given normal conditions.

A large square flag of red dayglo material which should be displayed as high as possible in the vessel is an invaluable aid to aircraft searching for small vessels in rough seas.

However, any signal that will attract attention and bring help is a satisfactory distress signal.

For small boats within sight of shore or other boats, a good "I need help" signal to adopt is that of slowly and repeatedly *RAISING AND LOWERING ARMS OUTSTRETCHED TO EACH SIDE.* This is a distinctive signal not likely to be mistaken for a greeting. To be as effective as possible the signal should be given from the highest vantage point on the boat, with consideration being given to colour contrast. A piece of white cloth held in the hands would add to its effect.



Should you be lost at sea and know you are being searched for, hoist a square metal object (a large oil tin) as high as possible. This will assist any vessel or aircraft using radar to locate you.

If you see another launch or boat in trouble or if friends have failed to return from a boating trip, *inform the nearest police station.* Give any assistance you can, but do not place your own boat in danger. Otherwise there will be two boats in trouble. There is a duty by law for you to render assistance if it can be rendered without serious danger for you and your crew. If you are in collision with another boat, do not leave the area until you make sure that the other boat is not in need of any assistance. This applies even although you think he was at fault in the collision. In event of collision you should exchange names and addresses and obtain any witnesses' names and addresses.

Below are the internationally recognised distress signals. All boat owners who use their boats in the open sea should make themselves familiar with them.

DISTRESS SIGNALS

When a vessel or seaplane on the water is in distress and requires assistance from other vessels or from the shore, the following shall be the signals to be used or displayed by her, either together or separately, namely:

(1) A gun or other explosive signal fired at intervals of about a minute:

(2) A continuous sounding with any fog-signal apparatus:

(3) Rockets or shells, throwing red stars fired one at a time at short intervals:

(4) A signal made by radiotelegraphy or by any other signalling method consisting of the group . . . — — — . . . in the Morse Code:

(5) A signal sent by radiotelephony consisting of the spoken word "Mayday":

(6) The International Code signal of distress indicated by N.C.:

(7) A signal consisting of a square flag having above or below it a ball or anything resembling a ball:

(8) Flames on the vessel (as from a burning tar barrel, oil barrel, etc):

(9) A rocket parachute flare or hand flare showing a red light.

(10) A smoke signal giving off a volume of orange coloured smoke.

(11) Slowly and repeatedly raising and lowering arms outstretched to each side.

The use of any of the above signals, except for the purpose of indicating that a vessel or a seaplane is in distress, and the use of any signals which may be confused with any of the above signals, is prohibited.

ABANDONING SHIP

Many boats involved in a casualty have continued to float indefinitely. If it becomes necessary to abandon your boat due to fire, swamping, capsizing, or other emergency, don't leave the area. Generally a damaged boat can be sighted more readily than a person in the water and it may help to keep you afloat.

Keep in mind that distance over water is deceptive. Usually the distance you estimate is much shorter than the actual distance. Keep your head and restrain your initial impulse to swim ashore. Calmly weigh the facts of the situation, such as injuries to passengers or children, the proximity of shore, and your swimming ability, before deciding on your course of action.

If there is time, put on your lifejackets (if it hasn't already been thought of) and ensure any others have theirs on too. If someone's likely to see it and you have one, send off a distress signal, smoke or flare. Don't waste one if there is little chance of somebody seeing it.

If you are not wearing your lifejacket, keep it handy. Many emergencies occur suddenly and a lifejacket securely stowed in an inaccessible place is useless.

MARINE DEPARTMENT NOTICES

Series B

From time to time the above notices are issued free from Government shipping offices of the Marine Department. Whenever lessons are learned which may avoid accidents and possibly save life, attention is drawn to them by means of these Notices. Those of particular interest to small boat owners are published as Series B Notices.

Here is the text of one printed not long ago:

"Attention is drawn to the need of placing batteries used for radiotelephone at sufficient height in the boat to ensure that the operation of the set is not interfered with should the vessel be damaged and making water.

"In a recent instance the crew of a sinking fishing boat were unable to send out a Mayday message because the batteries were stowed on the engineroom floor and were almost immediately put out of action.

"Fortunately the weather was good, land was near and the crew were able to get ashore after the boat sank. If this mishap had occurred further out to sea the consequences could have been disastrous."

Why not make inquiries about them?

YOU CAN HELP

If, at any time, you notice that a navigational aid is not functioning properly (e.g., a light in a lighthouse may be extinguished) or if a danger to shipping is observed (such as a large floating log) please notify the

Police or Marine Department as soon as possible. If you have radio, report to your nearest shore station.

Should you discover floating wreckage or any equipment or cargo at sea, hand it to the Police on your return, or, if it is too large, report it to them or the Marine Department. If you come across the wreckage of a boat, don't forget that there may be people in the water. Proceed cautiously and search the area. Report by radiotelephone if you have one.

CLOTHING FOR BOATING

This may seem unnecessary advice, but consider how boating differs from other recreations. In an open boat for example, there is no protection from the sun's rays and shade may be a long way distant. The sun's reflection off the surface of the water increases the hazards of sunburn. Remember to take protective clothing – you needn't wear it until it's necessary and you may be very grateful for it. Also carry a bottle of sunburn oil or lotion – you will discover that you take a tan much more quickly when boating.

Footwear

Your shoes should have a firm grip on the decks, otherwise the movement of the boat will make your feet slide from under you and you may end up in the water. Falls are doubly dangerous aboard a boat because of the deck fittings, corners and projections which you can fall against (not forgetting the water, of course). Leather sandals, or specially made rope-soled shoes are the best. Avoid smooth rubber soles – they prove dangerous when wet.

Never wear gumboots on board a boat. If you *do* end up in the water the air might remain in the gumboots and bring your feet to the surface. This makes it difficult to bring your head above the surface and breathe. If water fills them up, they will weigh down your feet.

Change of Weather

You may be induced by a beautiful morning to go out in your boat with light clothing. During the day a complete change of weather could occur and the temperature drop. You will then wish you had that spare sweater or jacket. Take particular care of children.

SEA FISHING FOR PLEASURE

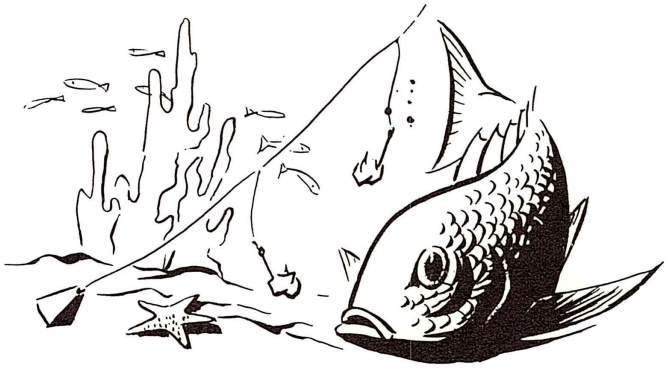
The taking of fish, shellfish or crayfish is subject to regulations under the Fisheries Act. While the following notes may prove helpful it is emphasised that they are not a complete summary of the regulations, but merely a guide to what the regulations contain. You should consult the local inspector of fisheries for further or current information, or make inquiry to one of the offices listed below:

Marine Department, P.O. Box 581, Whangarei
Marine Department, P.O. Box 1254, Auckland
Marine Department, P.O. Box 317, Tauranga
Marine Department, P.O. Box 195, Napier
Marine Department, P.O. Box 5066, Wellington
Marine Department, P.O. Box 1027, Port Nelson
Marine Department, P.O. Box 1237, Christchurch
Marine Department, P.O. Box 1244, Dunedin
Marine Department, P.O. Box 18, Bluff

Full copies of the Act and regulations are available at small cost from Government Bookshops at Auckland, Hamilton, Wellington, Christchurch and Dunedin.

Commercial fishing. It is necessary to register your boat and take out a fishing permit if you intend to take fish, crayfish, or shellfish for sale. Application forms may be obtained from the Marine Department.

Toheroa and other Shellfish. The toheroa season was closed in the North Island recently and there is no indication when it will be re-opened. At this stage it is advisable to consult the Marine Department regarding the taking of toheroa or other shellfish.



Flounders and soles Taking and possession is limited to 24 a person, 48 for two persons, and 60 for a party of three or more persons.

Information is given below on the minimum length of flatfish that may be taken, and the mesh size of nets that may be used.

Blue cod The limit catch in the Marlborough Sounds - French Pass area is 12 blue cod, to be brought ashore in a condition which permits them to be measured.

Crayfish The daily limit is 12 a person, 24 for two persons, and 30 for a party of three or more persons. The following classes of crayfish are protected and are required to be returned immediately to the water alive and unharmed:

1. Crayfish less than 10 in. in length.
2. Female crayfish carrying external eggs.
3. Crayfish in the soft shell stage.
4. All female crayfish taken off the South Island Coast (including Stewart Island) between Waipapa Point and Bruce Bay during the months of July, August, and September.

Fish (minimum size)

Measurement for length is made from the tip of the nose to the V of the tail. Fish of less than the following length are protected and must be returned immediately to the water.

Lemon sole, and square flounder (or dab)	9 in.
All other flounders and soles	10 in.
Red cod, snapper, tarakihi, trevally	10 in.
Mullett and moki	11 in.
Blue cod	12 in.
Butterfish	13 in.
Trumpeter	14 in.
Hapuku (groper)	24 in.

Mesh size

This is ascertained by measuring the mesh diagonally between knot and knot with the mesh closed, the net being wet and prepared for use. Nets are to be of a particular mesh size according to the kind of fish taken:

Butterfish (minimum mesh)	$4\frac{1}{4}$ in.
Flatfish (minimum mesh)	4 in.

Mullett (minimum mesh)	$3\frac{1}{4}$ in.
Herring (minimum mesh)	$1\frac{1}{4}$ in.
Garfish (minimum mesh)	1 in.
All other fish (minimum mesh)	$2\frac{1}{4}$ in.

In Kaipara Harbour, the mesh of set nets used to take fish by the process known as stalling shall not be less than $4\frac{1}{4}$ in.

Dragnets

Maximum length 44 yd.
Shall not be hauled on to dry land when they contain fish.
May be pulled only by hand.
Shall not be used in Kaipara Harbour.
In Hauraki Gulf, Tirau, Katikati, and Tauranga harbours, may not be used from a boat propelled other than solely by oars.

Set nets

Maximum length 66 yd
Only one permitted.
Shall not extend more than half way across a channel or stream.
Shall not be set between poles or stakes.
Shall not be set in such a manner that the fish are left stranded by the falling tide.

Whitebait

The open season in the North Island is from 1 August to 30 November, and the South Island from 1 September to 30 November. The mouth of a net may be up to 15 ft in circumference, provided the width of the net does not exceed one-third the width of the channel or stream where it is being used at the time. Each person is permitted one net which should not be left unattended in the water.

The whitebait regulations vary from place to place and you are advised to obtain full information from the local Inspector of Fisheries.

Seals

Seals are totally protected and should not be taken, injured, or disturbed.

LONG VOYAGES

This booklet is concerned mainly with small boats in local waters, but for those persons with a larger boat intending to make longer voyages the following section should hold some interest.

In this country safeguards are laid down by law and one of them affects yachtsmen or men with seagoing cruisers who wish to sail overseas or to more than 50 miles off the coast.

Before a yacht club holds an international race the officials of that club make sure that the boats are properly equipped and have competent crews. The Marine Department now does the same for all adventurers who want to go overseas. The only standard to reach is that required by experienced yachtsmen and, as far as possible, the Department has left the control of this law with the yacht clubs and their experienced officials.

(For those who wish to study the relevant law, it is contained in section 50 of the Shipping and Seamen Amendment No. 102, 1959, obtainable at any shipping office.)

Briefly the position is this. A New Zealand yacht wishing to go overseas must show a certificate to the Collector of Customs before departure. This certificate will show that the yacht has been inspected by two honorary yacht inspectors who have been nominated by their yacht clubs and approved by the Secretary for Marine. Certain other persons, e.g., ship surveyors, also may act as inspectors.

The task of the inspectors is to examine equipment of all kinds to be used in the forthcoming voyage and, if any more is needed or any strengthening or repairs required, the skipper or owner will be informed that for his own safety he should make good the deficiencies. The inspectors also make inquiries regarding the experience of the crew to see if they have sufficient knowledge of navigation and seamanship for the contemplated voyage.

Once the yacht and crew comply with the requirements, the yacht is then issued with a certificate and may sail on the voyage.

For yachts intending to go beyond 50 miles off the coast the master must produce a statement to the nearest harbourmaster or club commodore giving details of the route and intended destination of the yacht together with the names, addresses and next of kin of the crew.

On page 94 is reproduced a facsimile of the application form which has been designed for yacht owners contemplating either of the two types of voyage mentioned above.

For a boat going overseas the portion containing the report of the yacht inspectors must be completed.

(The "**10 minute form**" mentioned in this application is shown on page 95.)

Form M. 1434

Application for a Certificate for a Pleasure Yacht Departing for a Port Beyond New Zealand

To ..... Yacht Club.
or To Marine Department at .....

1. I hereby apply for the issue of a certificate under section 246B of the Shipping and Seamen Act 1952 for a voyage to a port beyond New Zealand.
2. (a) Name of pleasure yacht: .....
   (b) I am a member of ..... Yacht Club.
   (c) Yacht may be inspected at: .....
3. (a) Name of applicant (master): .....
   (b) Address of applicant: .....
   (c) Telephone No.: .....
   (d) Names of crew: .....
   .....
4. (a) Particulars of destination and route: .....
   .....
   (b) Proposed departure date: .....
5. I have on board the minimum equipment as shown overleaf.

Date: .....

.....
(Signature of applicant)

Honorary Yacht Inspector's Report

To the Hon. Secretary, ... Yacht Club.
or to the Secretary for Marine, P.O. Box 2395, Wellington.
and to .....
(Name of master or owner)

We have examined the hull, spars, rigging, equipments, stores, and machinery of the above yacht and inquired into the experience and qualifications of the master and crew, and are satisfied that the yacht with the above-named master and crew is reasonably suitable for the proposed voyage according to the standards generally accepted by experienced yachtsmen.

Dated at ..... this ..... day of ..... 19.....

..... *Signatures of honorary yacht inspectors appointed by the*

.... Club.
(or by the Secretary for Marine)

To Collector of Customs at .....
I hereby certify that the above pleasure yacht on the date of the inspector's report was suitable for the proposed voyage.

Note: A true statement of the intended destination and other particulars as set forth on the Marine Department's "10 Minute Form" (M. 1435) must be deposited with this certificate.

..... Hon. Sec. ..... Yacht Club.
Signature *(or Secretary for Marine)*

Form M. 1234

The 10 Minutes Utilised in Filling in This Form May Save Your Life

The information requested below could be of assistance to the Search and Rescue Organisation of New Zealand should it be called upon to save your life. SEARCH AND RESCUE ACTION IS INITIATED ONLY ON REQUEST.

Yachts departing for a port beyond New Zealand: This form is to be handed to the Collector of Customs, together with the suitability certificate before Customs clearance will be given.

Yachts sailing in New Zealand waters: This form is to be handed to the Yacht Club or nearest Harbourmaster.

Collectors of Customs, Yacht Clubs, and Harbourmasters are requested to hand this form to the local Police without delay.

1. Name of Vessel:_____ Registered number:_____
2. Bound from (port)_____ To (port)_____
   via (ports)_____
3. Date and time of leaving:_____
   Expected arrival date and time:_____
4. On board:

Full names (Master first)	Nationality	Next of kin (show relationship)	Address of next of kin

5. Contacts ashore: e.g., relatives, persons at ports of call and at destination:

Names	Addresses	Tel. Nos.

6. Length of vessel:_____ Rig:_____ Masts:_____
7. Colour of Hull:_____ Superstructure:_____ Deck:_____
8. Location of cabin, of boat, with colour:_____
9. Radio equipment: (Yes/No) Type of transmitter:_____
   Frequency (k/cs):_____ Call sign:_____
   Proposed watch schedule:_____
10. Food supply_____days. Water supply:_____days.
11. Type of engines:_____ Speed:_____Knots
12. Fuel supply:_____gals. Consumption:_____gals. per mile.
13. Emergency equipment: (state yes or no)
    "Gibson Girl" Transmitter:_____ Locator radio beacon transmitter:_____
    Flares (red):_____ Rafts (type):_____ Sea-dye markers:_____
14. Please supply sketch (or photograph) of vessel and attach to this form.
15. If the above voyage is not to a port beyond New Zealand but is one during which the yacht will be more than 50 miles from the nearest part of the coast of New Zealand, I undertake to comply with the rules overleaf, being the minimum sailing rules of a yacht club applicable to such a voyage approved by the Secretary for Marine.

Signature.....

Place and date.....

Minimum Sailing Rules of a Yacht Club Approved by the Secretary for Marine for Yachts Proceeding More than 50 Miles from Coast

(1) The following equipment shall be carried by the yacht:
  (a) One masthead light if vessel mechanically propelled,
  (b) Side lights and stern light,
  (c) One life belt, life jacket or adequate alternative for every person on board,
  (d) One life buoy,
  (e) Two anchors with sufficient chain or warp,
  (f) One fog whistle or the equivalent,
  (g) One efficient fire extinguisher and if mechanically propelled, an additional 10 lb dry powder or 2 gallons foam extinguisher,
  (h) One boat compass,
  (i) One dinghy of suitable design other than the collapsible type, and/or an inflatable life raft,
  (j) One torch, lantern, or signalling device,
  (k) Six red flares, six smoke candles.

(2) The master shall comply with such further provisions and stipulations and the yacht shall carry such additional equipment as required by the sailing rules of the yacht club to which the master belongs and not inconsistent with the above.

Issued by the Marine Department, Wellington, New Zealand. Copies can be obtained from any Police Station, from any Superintendent of Mercantile Marine, and from Yacht Clubs.

IDENTIFICATION

Small boats are difficult to see from the air: in order to make your boat more conspicuous it is an idea for you to carry a piece of canvas the size of your cabin top and painted "Flame Orange". In an emergency it can be spread out and tests have shown that it is easily seen from the air even in rough seas.

NAUTICAL MILES

Nautical Miles	Statute Miles	Statute Miles	Nautical Miles
1	1·15	1	0·87
2	2·30	2	1·74
3	3·45	3	2·61
4	4·61	4	3·47
5	5·76	5	4·34
6	6·91	6	5·21
7	8·06	7	6·08
8	9·21	8	6·95
9	10·36	9	7·82
10	11·52	10	8·68
20	23·03	20	17·37
30	34·55	30	26·05
40	46·06	40	34·74
50	57·58	50	43·42
60	69·09	60	52·10
70	80·61	70	60·79
80	92·12	80	69·47
90	103·64	90	78·16
100	115·15	100	86·84

How to use the miles conversion table:

One nautical mile (standard) = 6,080 ft
One statute mile = 5,280 ft

If your boat does 25 m.p.h., read the *right-hand* table to convert this speed into knots.

20 miles = 17·37
5 miles = 4·34

Total = 21·71 knots

Therefore your boat's speed in knots is 21·7.

Should you know your speed as 25 knots, use the *left-hand* table.

20 nautical miles = 23·03
5 nautical miles = 5·76

Total 28·79 miles/hour

Your boat's speed is 28·79 m.p.h.

The knot is a unit of speed being one nautical mile per hour. It is wrong to say "knots per hour" as this would mean "miles per hour per hour."

The word "knot" is derived from a method of estimating the speed in sailing ships. A line (the log line) was passed out over the stern once or more every watch, to which was attached a small piece of wood so weighted as to make a "drag" through the water. This would cause the loosely held line to run out over the stern as the vessel moved ahead. At calculated intervals along the line, knots were made and these were counted as they passed over the rail. Beside the seaman reading the log there was placed an hour glass – the sand dropping through in about 20 seconds. By counting the number of knots going over the side until the glass was emptied a fairly accurate estimate of the ship's present speed was obtained. She was doing "12 knots" or "10 knots". The expression has lingered, probably because it was quite a mouthful to say "12 nautical miles per hour" instead of the other.

CHARTS, TIDES AND PUBLICATIONS

Charts

Cruising on water is vastly different from motoring – although the surface of the water may be flat, unsuspected dangers can exist in the form of shoals, wrecks, or rocks.

If you are considering taking your boat on to a strange area of water you should have a chart. Even local men who are familiar with a stretch of water may find some additional information which is useful and interesting. The charts give water depth, obstructions, buoy positions, landmarks, coastlines, distance measuring, and the type of sea bottom amongst other things.

Depths are generally given in fathoms. One fathom is equal to 6 ft.

To make full use of the chart you should study it carefully and you should know most of the small abbreviations used. These are given in the *New Zealand Chart Catalogue* (see opposite).

Tides

The times of the tides are of the utmost importance to most boatmen. If you cannot get information from your newspaper or if you want to plan ahead – even if you want to have them handy for reference – the Marine Department publishes sets of tide tables for New Zealand waters.

The times of tides are given for a number of standard ports around a coastline. The times and heights of tides at other ports and places can be found by adding or subtracting time and height differences from the standard port readings.

Publications

The accompanying list sets out publications available in New Zealand and the places from which they may be obtained. All inquiries should be sent to:

The Chart Supervisor, Chart Depot, P.O. Box 5066, Wellington.

1. *New Zealand Nautical Almanac and Tide Tables* (Annual) – $2.00

   Apart from tidal predictions for 100 places, other subjects of interest are: Rule of the Road regulations; coastal distances; meteorological notes covering New Zealand and South Pacific; information on the use of charts; list of other main Government publications, a list of lights, radio beacons, and fog signals around the coast and in harbours, etc.

2. *New Zealand Tide Tables* (Annual) – 50c.

   Contains tidal predictions with explanations and worked examples for the layman. This is of particular use to owners of small craft.

3. *New Zealand Notices to Mariners* (Printed weekly)

   These contain information about changes to navigational aids and new hazards recently discovered and are used in the correction of charts and nautical publications. Available gratis on request.

4. *New Zealand Port Information Manual*

   A widely used manual, published in two parts (Part I – Texts; Part II – Plans and Photographs). This is priced at $14.25, and the parts are not sold separately. Information about 20 ports contained in this manual can also be purchased in loose-leaf form whereby any part (text or plan) can be purchased separately at a nominal cost.

5. *New Zealand Chart Catalogue* – 50c.

   Shows what charts are available, and the area covered by each. Also shows a list of symbols and abbreviations used on all marine charts.

6. *System of Buoyage and Beaconage for New Zealand* – 20c.

   Explains the buoyage and beaconage system operating in New Zealand waters.

7. *New Zealand Pilot* – $3.45

   A valuable book containing a wealth of information on the coasts, harbours, islands, dangers, currents, and winds, etc.

8. *Charts*

   Charts of the New Zealand coast, priced from 95c to $1.25.

Agents for the Sale of New Zealand Charts

Principal Agents

NEW ZEALAND	
Auckland	Captain G. W. Dunsford, 64 Fort Street (P.O. Box 3269). Government Shipping Office, Customs Street. Hydrographic Supplies Depot, North Head, Devonport, N. 1 (P.O. Box 32053).
Bluff	Government Shipping Office, Ferry Building (P.O. Box 18).
Dunedin	Government Shipping Office, Corner of Liverpool and Crawford Streets (P.O. Box 1244).
Lyttelton	Government Shipping Office, Canterbury Street (P.O. Box 17).
Port Nelson	Government Shipping Office, Collins Street (P.O. Box 1027).
Wellington	Marine Department Chart Agency, Stout Street (P.O. Box 5066).
ABROAD	
Liverpool	Dubois-Phillips and McCallum Ltd., 11 Rumford Place, 3.
London	S. Smith and Son (England Ltd.), Kelvin and Hughes Division, St. Clare House, Minories, E.C. 3. Lilley and Reynolds Ltd., 9 Railway Place, Fenchurch Street, E.C. 3.
Taunton (Somerset)	Hydrographic Supplies Establishment, Creechbarrow House.
Melbourne (Victoria)	John Donne and Son, 372–78 Post Office Place.
Sydney (N.S.W.)	The RAN Chart Agency, Garden Island.
Hong Kong	George Falconer and Co. (H.K.) Ltd., 640 Alexandra House, Chater Road (P.O. Box 647). K. L. Wong and Co., 606 Man Yee Building, 60–70 Des Voeux Road, Central.

Local Agents

Auckland	Auckland Shipping Services Ltd., 26 Albert Street (P.O. Box 3685). J. H. Bigelow Ltd., Shortland Street (P.O. Box 420). M. F. Brown and Co. Ltd., 396 Lake Road, Takapuna (P.O. Box 164). Government Bookshop, State Advances Building, Rutland Street (P.O. Box 5344). J. F. Hargrave (Auckland) Ltd., 29–37 Customs Street West (P.O. Box 975). T. Jackson, 163 Victoria Road, Devonport. A. K. Little, 11 Victoria Road, Devonport. Pania Books and Art Centre, 5 Milford Rd., Milford. Scott-Mackie and Whiston, 14–18 Customs Street (P.O. Box 2688). Technical Books Ltd., 27–33 Victoria Street West (P.O. Box 5402). Whitcombe and Tombs Ltd., Queen Street (Private Bag, C.P.O.). Frank Wiseman Ltd., 166 Queen Street (P.O. Box 1950).
Acacia Bay (Lake Taupo)	Acacia Bay Lodge Ltd., (P.O. Box 61, Taupo).
Blenheim	E. Y. Penny, Maxwell Road (P.O. Box 85.)

Christchurch	Whitcombe and Tombs Ltd., Cashel Street, C. 1. (P.O. Box 1465). Government Bookshop, 112 Gloucester Street (P.O. Box 1721). Mahan Marine (Christchurch) Ltd., 5 Victoria Street.
Dannevirke	The Sports Depot, 87 High Street.
Dunedin	Government Bookshop, corner of Water and Bond Streets (P.O. Box 1104).
Gisborne	Brownies Book Shop Ltd., 222 Gladstone Road.
Hamilton	Map and Plan Services, British Traders Insurance Building, Garden Place.
Hastings	Hastings Sports Supplies Ltd., 306 Heretaunga Street. Motor and Marine Ltd., 801 West Heretaunga Street (P.O. Box 679). Whitcombe and Tombs Ltd., King Street (P.O. Box 442).
Levin	Rex Cederwalls Sports Centre Ltd., 313 Oxford Street (P.O. Box 276).
Lower Hutt	Whitcombe and Tombs Ltd., 194 High Street.
Manurewa	M. M. Hunt, 176 Great South Road.
Masterton	R. R. Stevens Ltd., Queen Street (P.O. Box 446).
Motuaopa (Lake Taupo)	Motuopa Lodge and Motels Ltd. (Private Bag National Park).
Mt. Maunganui	McDougall's Book Shop, Main Road.
Napier	Fosters Ship Chandlery Ltd., 1 Carlyle Street (P.O. Box 528).
Nelson	J. E. Hounsell and Co. Ltd., 181 Trafalgar Street (P.O. Box 327).
New Plymouth	Newton King Ltd., Shipping Department (P.O. Box 244). Thomas Avery and Sons Ltd., 77 Devon Street (P.O. Box 442).
Oamaru	J. T. Adams and Son, Thames Street.
Papakura	Universal Book Shop Ltd., 186 Great South Road. Papakura Stationers Ltd., 20–22 Broadway (P.O. Box 51).
Paraparaumu Beach	Cooper's Sports Centre Ltd., Maclean Street (P.O. Box 453).
Picton	Queen Charlotte Launches.
Raglan	C. A. Webb, Bow Street.
Rotorua	Rotorua Lake Services Ltd. (P.O. Box 389).
Russell	The House of Gifts, The Strand (P.O. Box 25).
Silverdale	N. T. Gatman (P.O. Box 18).
Takaka	Wadsworths Cash Stores Ltd., Commercial Street (P.O. Box 33).
Taupo	Ngauruhoe Travel and Sports Supplies (P.O. Box 335). Price's Stationery Ltd., Tongariro Street (P.O. Box 368). Taupo Sports Depot Ltd., 10 Robert Street. Vincent's (Booksellers and Stationers), Tongariro Street (P.O. Box 426).
Tauranga	Tauranga Book Shop, 14 Wharf Street. Norman Hore Ltd., Devonport Road (P.O. Box 53). Bourne's Bookshop Ltd., Willow Street.
Te Aroha	Raffan's Book and Gift Shop, Whitaker Street (P.O. Box 91).
Timaru	Whitcombe and Tombs Ltd., Stafford Street (P.O. Box 509). Mahan Marine (Timaru) Ltd., 56 Stafford Street.
Turangi (Lake Taupo)	R. Sanderson Ltd. (via National Park).

Upper Hutt	Clarkes Agencies, Travel and Estate Agents, Main Street North (P.O. Box 96).
Wairoa, H.B.	Robert Holt and Sons (Wairoa), North Clyde (P.O. Box 143). Smalls Bookshop (P.O. Box 119).
Wanganui	H. I. Jones and Son Ltd., 41 Victoria Avenue.
Wellington	J. F. Gordon and Co. Ltd., 25 Lower Cuba Street. Government Bookshop, Mulgrave Street. Whitcombe and Tombs Ltd., 312 Lambton Quay (P.O. Box 1894).
Whakatane	Armstrongs Bookshop Ltd. (P.O. Box 242).
Whangarei	Booklovers Bookshop, 67 Bank Street. Coutts the Chemists, Book Dept., 43 Bank Street (P.O. Box 39).

NOTE—In general local agents stock only charts of their own and adjacent areas.

CERTIFICATES AND LICENCES

1. Full information regarding Certificates and Licences can be obtained from "The Masters (Restricted Home Trade and Fishing Boats) Examination Regulations 1966" and amendments obtainable from the Government Printer, Wellington or agencies, price 18c.
2. Candidates for certificates and licences are required to pass an eyesight test in both form and colour vision. If you intend to apply for examination you should make sure your eyesight meets the required standard. Eyesight tests are held on application to Marine Department in Auckland, Wellington, Lyttelton, and Dunedin.

Pleasure Boat Certificates

Master of a Pleasure Yacht (First Grade)

The Marine Department offers the certificate as a master of a pleasure yacht grade for those yachtsmen and boat owners who wish to prove their aptitude and learning in navigation, chart work, compass deviation, and seamanship. The fee for entry to the examination is $4 and examinations are held monthly in Auckland and Wellington except January.

Here is an extract from the regulations relating to the examinations of masters.

Master of pleasure yacht, First Grade—(1) A candidate for a certificate as master of pleasure yacht must have at least three years yachting experience or its equivalent.

(2) The examination for this certificate is purely voluntary, and is confined to those persons who have served in a pleasure yacht and are at least 19 years of age.

(3) The certificate shall not entitle the holder to command any vessel except a pleasure yacht.

(4) Pleasure yacht means a sailing or motor pleasure vessel.

	Hours	Marks	Percentage Pass
First Day:			
(1) Chart Work	2½	150	60
(2) Practical Navigation I	2	150	60
Second Day:			
(3) Practical Navigation II	2½	150	60
(4) Compass Deviation	1½	100	—
Third Day:			
(5) English	1	100	50
		650	70

Orals as convenient

Master of pleasure yacht, First Grade—The syllabus for the examination for a certificate as master of pleasure yacht is as follows, and in each paper questions may be set combining one or more paragraphs:

Written

Paper 1—CHARTWORK AND PILOTAGE (Two and a half hours)

(a) Given the variation and a table of deviations, to convert true courses into magnetic and compass courses and *vice versa*. To find the compass course and distance between two positions. The effect of current on speed. Allowances for leeway. To find the compass course to steer allowing for a current. Given compass course steered, the speed of the ship, and the direction and rate of the current, to find the true course made good.

(b) To fix the ship's position on a chart by simultaneous cross bearings, bearing and range or by wireless cross bearings, applying the necessary corrections. Also, to fix the ship's position by horizontal angles. To fix the ship's position by bearings of one or more objects with the run between, allowing for a current and to find the distance at which the ship will pass a given point. The simple use of a single position line approaching the coast.

(c) The use of clearing marks and horizontal and vertical danger angles.

(d) To find the time and height of high water and low water at a New Zealand port (New Zealand Tide Tables). The use of tables to find the height of the tide at any given time and thence the approximate correction to soundings or to the charted heights of shore objects.

(e) Candidates shall be examined orally on the information given on a chart or plan, particularly about buoys, lights, depths and nature of bottom, contour lines, tides, and tidal streams. Recognition of the coast. The intelligent use of sailing directions. Chart correction.

(f) Distance of sighting lights. Distance of a point of land of known height.

(g) The use of bearings obtained by ship's wireless direction finder and bearings given from a shore station. The use of wireless beacons.

(h) Candidates shall be examined orally on the selection of suitable points for bearings, approaching an anchorage, and entering narrow waters. The reliability of charts.

(i) The construction of a line of soundings.

Paper 2—PRACTICAL NAVIGATION 1 (Two hours)

(a) To find the true bearing of the sun and the deviation of the compass for the direction of the ship's head.

(b) To find the latitude by meridian altitude of the sun.

(c) To determine the position line and a position through which it passes from an observation of the sun out of the meridian.

(d) Use of traverse tables to obtain the ship's position.

Paper 3—PRACTICAL NAVIGATION II (Two and a half hours)

(a) To find the true bearings of either sun, moon, or a star and the deviation for the direction of the ship's head.

(b) To find the approximate New Zealand standard time only (to the nearest minute) of the meridian passage of a star. To find the latitude by meridian altitude of a star above or below the pole.

(c) From an observation of sun or star near the meridian to find the position line and the latitude through which it passes corresponding to a given longitude.

(d) To determine the position line and a position through which it passes from an observation of a star out of the meridian.

(e) Recognition of stars of the first magnitude by reference to the principal constellations (home-trade limits).

Paper 4—COMPASS DEVIATION (One and a half hours)

(a) A simple knowledge of the meaning of hard and soft iron. Simple ideas of the effect of hard iron, vertical soft iron, and horizontal soft iron on the deviation of the compass. The means used to compensate for these effects with special reference to home-trade ships.

(b) Care and maintenance of magnetic compasses. Siting of compasses with particular reference to the proximity of magnetic materials and electrical appliances.

(c) To find the magnetic bearing of a distant object from compass bearings taken on equidistant points and to construct a table of deviations. Use and application of variation. Use of azimuth mirror.

Paper 5—ENGLISH (One hour)

This paper shall be designed to test the candidate's ability to write clear and grammatical English with due attention to spelling, legibility, and neatness. It shall in no sense be a test of technical knowledge. This paper may consist of an essay or an exercise in writing a letter or report.

Oral

1. (a) A full knowledge of the content and application of the Regulations for Preventing Collisions at Sea. (Candidates shall not be placed in the position of handling a square-rigged sailing ship, but shall be expected to recognise a sailing ship's lights and to have a knowledge of her possible manoeuvres according to the direction of the wind.)

(b) Distress and pilot signals; penalties for misuse.

(c) Uniform system of buoyage; wreck-marking system; New Zealand bar and tide signals. New Zealand Notices to Mariners and Marine Department Notices.

2. (a) Handling a ship in bad weather and when it is disabled.

(b) Preservation of crew and passengers in the event of wreck. Abandoning a wrecked ship. Rockets and rocket lifesaving apparatus. Communications with the shore.

(c) Assisting a vessel in distress. Rescuing the crew of a disabled ship.

(d) Keeping an anchor watch; dragging anchor.

(e) Care, maintenance, and use of the lifesaving appliances and fire appliances carried by this class of ship.

(f) Management of boats under oars or sail and in heavy weather; beaching or landing; coming alongside.

3. General knowledge of the requirements of the Shipping and Seamen Act 1952 relating to pleasure yachts.

4. (a) Marking of ordinary lead line and taking a cast.

(b) The use and upkeep of sounding appliances and logs.

5. Prevention of fire at sea. Full knowledge of the use of fire appliances and the precautions to be taken in their use. Special reference to the extinguishing of oil-fuel fires.

6. (a) A knowledge of local meteorology and of the weather services available to shipping in New Zealand coastal areas. Broadcast storm warnings.

(b) To read and understand an aneroid barometer, a thermometer, and a hydrometer.

(c) To use a sextant for taking vertical and horizontal angles and to find the index error.

Signals

To send and receive signals in—

(a) British semaphore—up to eight words per minute.

(b) Morse code by flash lamp—up to six words per minute.

(c) International Code of Signals.

Master of a Pleasure Yacht (Second Grade)

The examination for this certificate is voluntary and provides an opportunity for pleasure-boat owners and crew members of pleasure boats to gain a certificate of competency of a standard sufficient to enable them to manage pleasure boats with safety and seamanlike prudence in sheltered and partially sheltered coastal waters of New Zealand.

A candidate for this certificate must be not less than 16 years of age, and no service is required.

The candidate must satisfy the examiner in the following subjects in which he will be examined:

Written

The candidate must be able to read and write the English language. His writing may be tested by not less than 15 minutes' dictation.

Oral

(a) Lights carried by different classes of vessels.

(b) Fog signals used by different classes of vessels.

(c) Day signals carried by different classes of vessels.

(d) Simple rule of the road and the avoidance of collision.

(e) Buoys and daymarks used in New Zealand. Recognition of coastal and other lights.

(f) Lifesaving equipment to carry and how to use it.

(g) Firefighting equipment and its use. Prevention of fire.

(h) Distress signals by day and night.

(i) The use of radio telephone and correct distress procedure.

(j) Equipment to carry and its uses – anchor, boathook, bucket, first aid kit, mooring lines, sea anchor, oars, bailer, spare engine parts, tools, distress signals etc.

(k) Simple knowledge of the use of charts including symbols and abbreviations; tide tables; Marine Department Notices and other nautical publications.

(l) Elementary knowledge of the compass; how to steer a course; care and maintenance; use of transits and clearing bearings.

(m) Tides: Finding times and height of high and low water at Standard and Secondary ports from the New Zealand Tide Tables. Spring and Neap tides. Use of soundings. Effect of tides and currents.

(n) Boat handling. Simple stability of boats, anchoring; management in rough seas, and in surf. Jet boat handling (as applicable).

(o) Motor Launch Regulations and the responsibility of owners; water skiing. General Harbour Regulations as applicable to small boats.

(p) Weather information available.

(q) Emergencies. Stranding; collision; fire; breakdowns; heaving to; leaks; towing etc.

(r) Search and Rescue organisation.

(s) Single letter flags of the International Code and their meanings.

(t) Any other question relating to the duties of the Master of a Pleasure Yacht (Second Grade) which the examiner may consider it necessary to ask.

Candidates will be examined generally in the various types of boats, and particularly in the type they own or are accustomed to, i.e. outboard, inboard engines, jet boats etc.

Restricted Limit Launchmaster and Local Launchman's Licence

For those who wish to hold proof showing that they have a certain minimum experience in launches and have passed an examination in seamanship and boat safety, the Marine Department offers the above qualifications.

(This certificate or licence which is issued on satisfactory completion of the examination also enables the holder to operate a boat not over 50 ft in length carrying passengers for hire or reward provided his boat is surveyed by the Marine Department and operates in Restricted Limits.)

The fee for entry to the examination is £3. Examinations are held monthly in Auckland and Wellington except January, and by arrangement in Dunedin, Lyttelton and Wellington. Hereunder an extract from the regulations:

Master of restricted-limit launch—(1) A candidate for a certificate as master of restricted-limit launch must be not less than 19 years of age and, unless a certificate of physical fitness by a registered medical practitioner is produced, not more than 65 years of age.

(2) He must produce proof of not less than two years' service in a deck capacity on, or in charge of, a vessel plying at sea or on a navigable lake or in a harbour or in river limits or extended river limits.

(3) Not less than 12 months of the qualifying service required must have been served during the 15 years preceding the date of examination.

Local launchman's licence—(1) A candidate for a local launchman's licence must be not less than 19 years of age and, unless a certificate of physical fitness by a registered medical practitioner is produced, not more than 65 years of age.

(2) He must produce proof of not less than six months' experience in a launch plying at sea or on a navigable lake or in a harbour or in river limits or extended river limits. In each case not less than one month must have been served on a launch in the area for which the licence is required within the last 12 months prior to date of application.

Service in yachts and motor launches—Service in pleasure yachts and motor launches shall be accepted as qualifying service under the following conditions—

(a) It must always be verified by satisfactory proofs, which must set forth clearly and in detail the nature and duration of the service claimed:

(b) Service in sailing yachts and motor launches may be accepted as qualifying service for any grade of certificate, but the value of such service must be assessed by the Examiner in each case according to the grade of certificate required.

Master of restricted-limit launch—The syllabus for the examination for a certificate as master of restricted-limit launch is as follows:

Written

The candidate must be able to read and write the English language. His writing may be tested by not less than 15 minutes' dictation.

Oral

1. **NAUTICAL SECTION:** The candidate must satisfy the Examiner in the following subjects, in which he shall be examined orally:

(a) Regulations for Prevention of Collisions at Sea.

(b) Single-letter signals, International Code.

(c) General Harbour Regulations. Motor Launch Regulations. New Zealand system of buoyage.

(d) The markings, signs, and abbreviations on Admiralty charts.

(e) Marking and use of the ordinary hand lead.

(f) Knowledge and use of the mariner's compass.

(g) Knowledge and use of the lifesaving appliances and fire-fighting appliances required for this class of ship.

(h) The use and maintenance of deck appliances and steering gear.

(i) Accidents: beaching, running aground, fires, leaks, handling a disabled ship, taking the ground alongside or at moorings.

(j) Anchors and anchor work, towing and being towed. Handling ship in stormy weather.

(k) Knowledge of radiotelephone distress-call procedure. Care and maintenance of radiotelephone equipment.

(l) Danger of free-water surfaces on the stability of a vessel.

(m) Particular knowledge of the class of vessel candidate is expected to be employed in.

(n) Navigating and towing in particular channels and fairways. Navigating in low visibility.

(o) Any question relating to the duties of the master of this class of ship which the Examiners may consider necessary to ask.

2. **ENGINEERING SECTION:** (a) Four-stroke and two-stroke engines: cycle of events taking place in cylinders;

(b) Petrol Engines: Resetting of magneto or battery ignition system without witness marks;

(c) Carburettor: How it operates and how to deal with petrol stoppage;

(d) Diesel Engines: Fundamental difference between petrol and diesel engine. Exact temperature and pressures not necessary;

(e) All engines – Petrol and Diesel: How lubrication of the various bearings is carried out. Cause of failure and how to deal with same. Trace path of lubricating oil from sump back to the same;

(f) Cooling Water: Trace path. Cause of failure and how to deal with it. Overheating and how to proceed;

(g) Pumps: Type of pump frequently employed to pump water or oil;

(h) Fuel Pumps: Action of fuel pumps and how quantity of oil per stroke is controlled;

(i) Starting: System used in small engines, and care required to ensure no water in cylinders;

(j) Preparing Engine for Sea: A full and complete knowledge of how to prepare the engine for sea;

(k) Engine Parts and Functions: Support of propeller shaft, fixing of propeller. Function of thrust. How reversing is carried out. Object of tappet clearance;

(l) Precautions against Fire and Explosion: Management of engine room. Cleanliness. No accumulation of oil or rubbish. Ventilation of closed spaces. Upkeep of firefighting equipment. Care in opening fuel tanks. Gauze wire over oil-tank air pipes;

(m) Batteries: Care and upkeep;

(n) Bilge Pumps: How they work and possible cause of failure;

(o) Any other question relating to the engineering duties of the master of this class of ship which the Examiner may consider necessary.

The syllabus for the examination for a local launchman's licence is the same as above for restricted-limit launchmaster except he shall be examined only in so far as it applies to the particular area and ship in which he has to serve. (That is to say that a launchman operating on a small inland lake would not be asked questions relating to a launch which plies in a busy harbour.)

For these certificates a certain minimum standard of eyesight in both form and colour vision is required. If you intend to apply for examination you should ensure beforehand that your eyesight meets the standard. Eyesight examinations are held by arrangement in Auckland, Wellington, Lyttelton, and Dunedin.

For full information write to:

The Secretary for Marine, P.O. Box 2395, Wellington, or call at the Marine Department, Wellington.

KEEP NEW ZEALAND GREEN

BOATS WITH RADIOTELEPHONE

During periods of high fire hazard in your area, you can be of assistance to the Forest Service by reporting by radio any fires seen from seaward. You should contact your nearest harbour radio station or a main station (ZLW, etc.) who will in turn notify the proper authorities.

This information is particularly useful to the Forest Service in areas like Marlborough Sounds.

If you have a picnic ashore, make certain your fire is permissible and safe – fully extinguish it before leaving.

YOU MAY HAVE SUGGESTIONS

If you have ideas which could help to save life, or should you wish to make inquiries, write to:

The Secretary for Marine, P.O. Box 2395, Wellington.

RESCUE BREATHING

DON'T WASTE TIME – BEGIN AT ONCE

Place the victim on his back and begin rescue breathing. Your first blowing efforts will show if his air passages are blocked and, if they are clear, will provide the urgently needed oxygen. If his throat is blocked, clear it quickly with your fingers. Slaps between the shoulder blades should dislodge a stubborn blockage.

Rescue breathing through the patient's nose is less likely to force air into his stomach. If his nose is blocked, however, try rescue breathing through his mouth.

In an unconscious person with his head slumped, the tongue blocks the throat and little or no air can get into his lungs. Lift his neck and tilt his head right back – halfway tilt is not enough – and he may start breathing for himself. If he does not, start rescue breathing.

Hold the head fully tilted with chin pulled forward. Take a deep breath, open your mouth wide (fig. 1), and seal your lips on his cheeks round his nose, keeping his mouth closed and taking care not to pinch his nostrils (fig. 2).

Then blow until you see his chest rise. If you are rescue breathing through his mouth, seal your lips round his opened mouth, blocking his nostrils with your cheek – or pinching them with your fingers – to prevent air leakage.

Remove your mouth and listen to him breathing out through mouth and nose – part his lips if you are breathing through his nose – while you are taking another breath (fig. 3). Inflate his lungs again as soon as he has breathed out.

Use only puffs from your cheeks for infants. Stop blowing as soon as the chest starts to rise. Repeat breaths at least 20 times a minute.

Make the first 5 to 10 breaths deep and rapid. Then continue with 10 to 15 breaths a minute. When he starts trying to breathe for himself, keep your breaths in time with his efforts.

Fig. 1 Fig. 2 Fig. 3

APPENDIX I

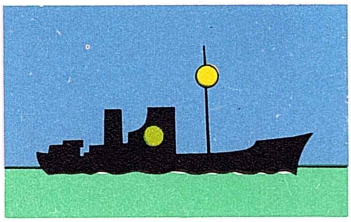
LIGHTS AND DAYMARKS OF VESSELS

The following diagrams and descriptions are given to assist you to quickly recognise the *main* lights and shapes required by various types of vessels.

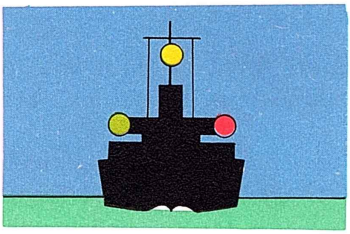
For a more detailed description of these signals, and others which may be shown, reference should be made to the "International Regulations for Preventing Collisions At Sea" which are included in this booklet.

It must be stressed that these diagrams and descriptions are not intended to replace the Regulations but to help explain them.

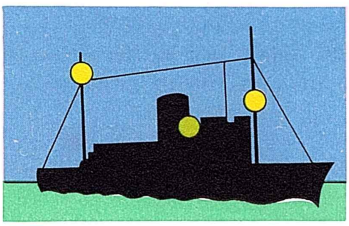
NOTE: "under way" means not anchored, made fast to the shore or aground. "Making way" means actually moving through the water.



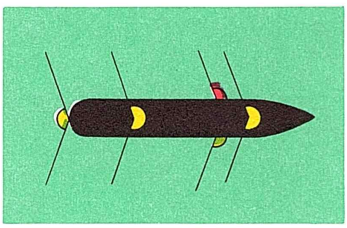
Power-driven vessel under way, less than 150 ft in length *(Rule 2)*.



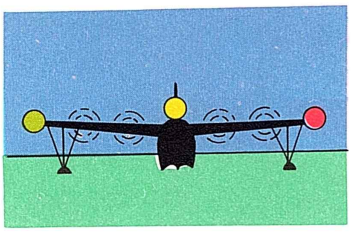
Above vessel seen from head on.



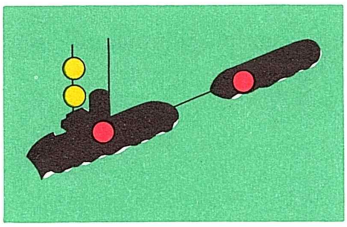
Power-driven vessel under way, 150 ft in length and over *(Rule 2)*.



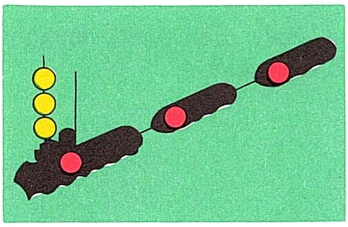
Arcs of visibility for lights of power-driven vessels *(Rule 2)*.



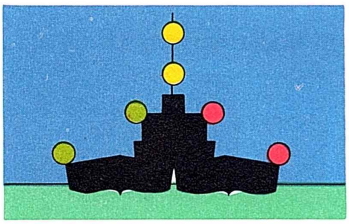
Seaplane under way, on the water *(Rule 2)*.



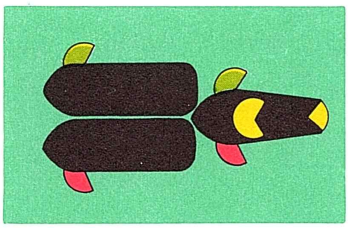
"Tug and tow", length of tow 600 ft or less *(Rules 3 and 5)*.



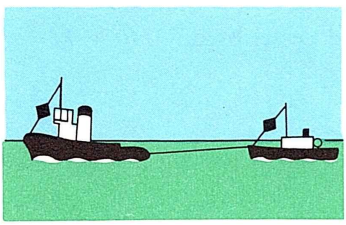
"Tug and tow", length of tow more than 600 ft *(Rules 3 and 5)*.



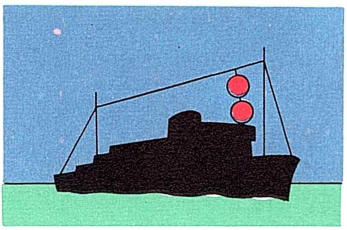
Vessel pushing two other vessels, seen from head on *(Rules 3 and 5)*.



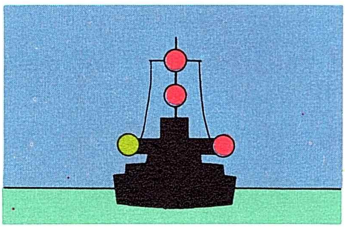
Arcs of visibility for lights of the above vessels *(Rules 3 and 5)*.



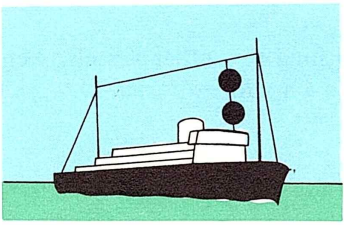
"Tug and tow" by day, length of tow more than 600 ft *(Rules 3 and 5)*.



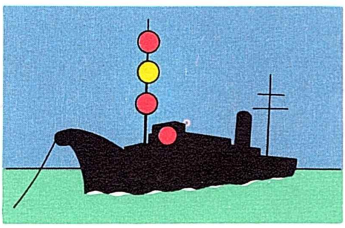
Vessel not under command and stopped *(Rule 4)*.



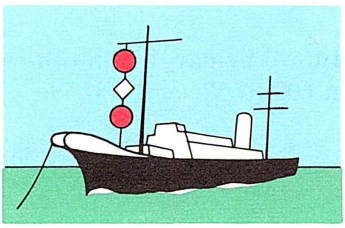
Vessel not under command, making way, head on *(Rule 4)*.



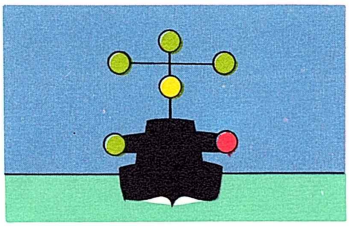
Vessel not under command by day *(Rule 4)*.



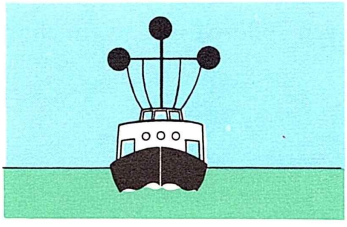
Hampered vessel making way *(Rule 4)*.



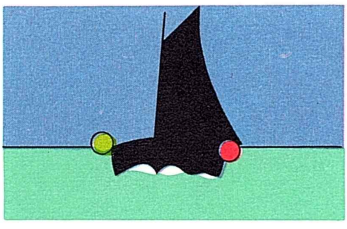
Hampered vessel by day *(Rule 4)*.



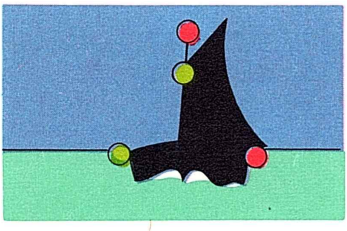
Minesweeper under way, danger on both sides *(Rule 4)*.



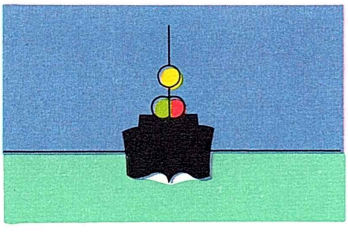
Above vessel by day *(Rule 4)*.



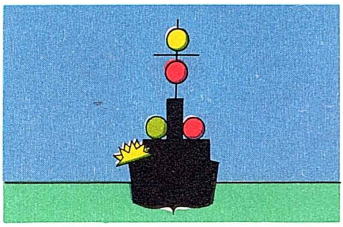
Sailing vessel under way, seen from head on *(Rule 5)*.



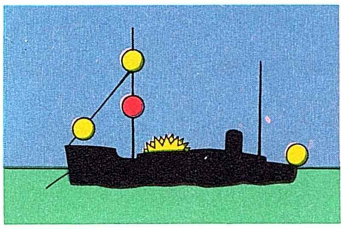
Sailing vessel under way, seen from head on, showing optional masthead lights *(Rule 5)*.



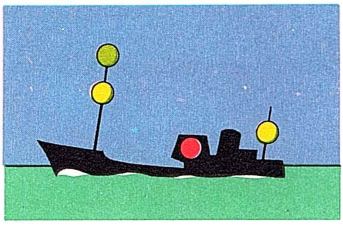
Power-driven vessel under way, less than 65 ft in length, seen from head on *(Rule 7)*.



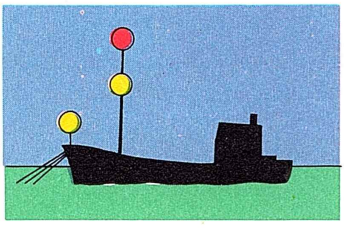
Power-driven pilot-vessel making way *(Rule 8)*.



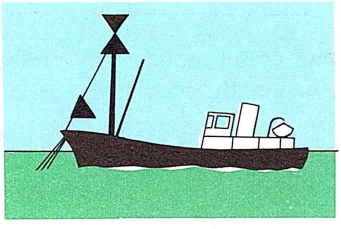
Power-driven pilot-vessel at anchor *(Rule 8)*.



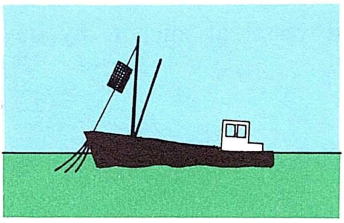
Vessel trawling, making way *(Rule 9)*.



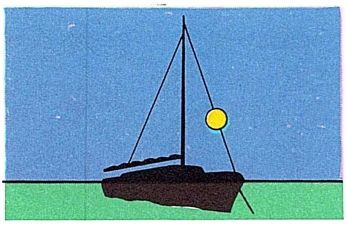
Vessel fishing (not trawling), not making way, gear extending more than 500 ft horizontally into the seaway (*Rule 9*).



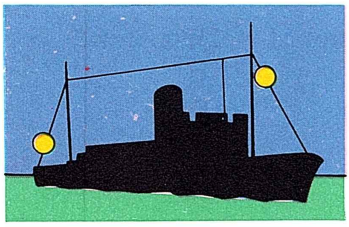
Vessel fishing, gear extending more than 500 ft horizontally into the seaway, by day *(Rule 9)*.



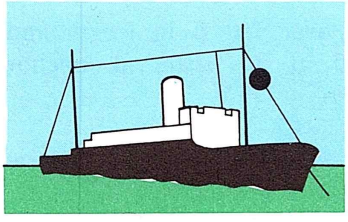
Vessel fishing, less than 65 ft in length, lines extending less than 500 ft horizontally into the seaway, by day *(Rule 9)*.



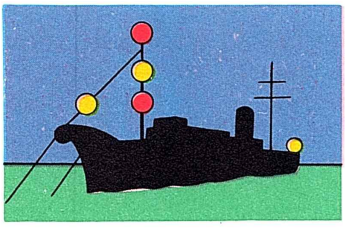
Vessel under 150 ft in length at anchor *(Rule 11)*.



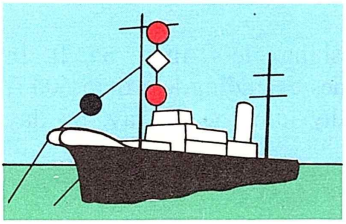
Vessel 150 ft in length and over at anchor *(Rule 11)*.



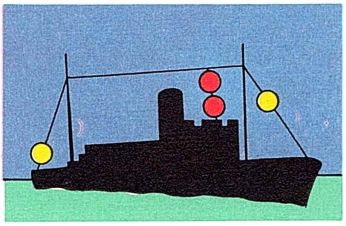
Vessel at anchor by day *(Rule 11)*.



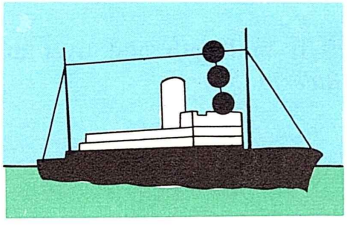
Hampered vessel at anchor *(Rule 11)*.



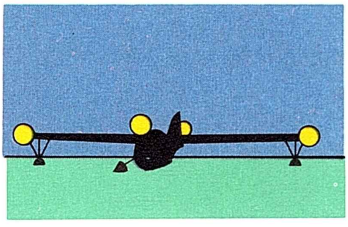
Hampered vessel at anchor, by day *(Rule 11)*.



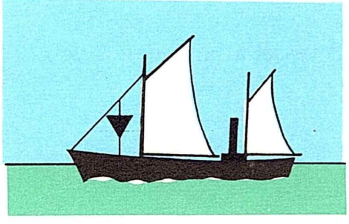
Vessel aground, 150 ft in length and over *(Rule 11)*.



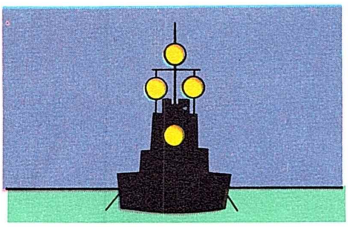
Vessel aground, 65 ft in length and over, by day *(Rule 11)*.

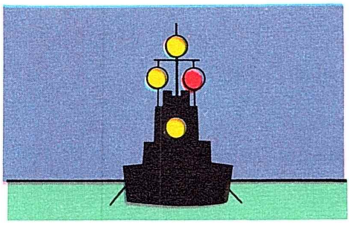


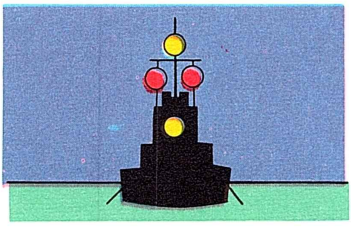
Seaplane over 150 ft in length and over 150 ft in span at anchor *(Rule 11)*.



Vessel proceeding under sail when also being propelled by machinery, by day *(Rule 14)*.







DREDGERS IN NEW ZEALAND

Dredgers in New Zealand show the following signals:

Clear both sides – three all-round white lights forming a triangle, point up (top left);

Foul one side – a red light replaces the white light at the base of the triangle on the dangerous side (centre left);

Foul both sides – red lights replace the white lights at the base of the triangle (bottom left).

NOTE: By day, black balls replace the white lights and red cones replace the red lights.

The diagrams illustrate dredgers on station, at anchor.

APPENDIX II

THE COLLISION REGULATIONS ORDER 1965

BERNARD FERGUSSON, Governor-General

ORDER IN COUNCIL

At the Government Buildings at Wellington this 22nd day of March 1965

Present:

THE RIGHT HON. KEITH HOLYOAKE, C.H., PRESIDING IN COUNCIL

PURSUANT to the Shipping and Seamen Act 1952, His Excellency the Governor-General, acting by and with the advice and consent of the Executive Council, hereby makes the following order.

ORDER

1. (1) This order may be cited as the Collision Regulations Order 1965.

(2) This order shall come into force on the 1st day of September 1965.

2. The International Regulations for Preventing Collisions at Sea set forth in the First Schedule to this order shall, with the exception of rule 31 thereof, constitute the collision regulations referred to in section 286 of the Shipping and Seamen Act 1952, and are hereinafter referred to as the collision Regulations.

3. The Collision Regulations shall apply to—

(a) All ships and seaplanes which are locally within the jurisdiction of New Zealand, whether or not they are Commonwealth ships or seaplanes registered in or belonging to any Commonwealth country:

(b) All Commonwealth ships and all seaplanes which are registered in or belong to any Commonwealth country, whether or not they are locally within the jurisdiction of New Zealand or of any other Commonwealth country:

(c) All ships and seaplanes which are registered in or belong to any of the countries specified in the Second Schedule to this order, whether or not they are locally within the jurisdiction of New Zealand or of any other Commonwealth country, and those ships and seaplanes shall for the purposes of this order be treated as New Zealand ships or, as the case may be, seaplanes registered in or belonging to New Zealand.

4. The signals specified in rule 31 of the aforesaid International Regulations for Preventing Collisions at Sea and in the note appended to that rule shall be the signals referred to in section 293 of the Shipping and Seamen Act 1952 which are to be used by ships as signals of distress.

5. Nothing in this order shall be construed as authorising the prosecution of the master or owner of a foreign ship or the owner or person in charge of a seaplane registered in or belonging to a foreign country for an offence consisting only of an act or omission outside the local jurisdiction of New Zealand or any other Commonwealth country.

6. The Collision Regulations Order 1953 is hereby revoked.

SCHEDULES

FIRST SCHEDULE

INTERNATIONAL REGULATIONS FOR PREVENTING COLLISIONS AT SEA

PART A—PRELIMINARY AND DEFINITIONS

RULE 1

(a) These rules shall be followed by all vessels and seaplanes upon the high seas and in all waters connected therewith navigable by sea-going vessels, except as provided in rule 30. Where, as a result of their special construction, it is not possible for seaplanes to comply fully with the provisions of rules specifying the carrying of lights and shapes, these provisions shall be followed as closely as circumstances permit.

(b) The rules concerning lights shall be complied with in all weathers from sunset to sunrise, and during such times no other lights shall be exhibited, except such lights as cannot be mistaken for the prescribed lights or do not impair their visibility or distinctive character, or interfere with the keeping of a proper lookout. The lights prescribed by these rules may also be exhibited from sunrise to sunset in restricted visibility and in all other circumstances when it is deemed necessary.

(c) In the following rules, except where the context otherwise requires,—

(i) The word "vessel" includes every description of water craft, other than a seaplane on the water, used or capable of being used as a means of transportation on water:

(ii) The word "seaplane" includes a flying boat and any other aircraft designed to manoeuvre on the water:

(iii) The term "power-driven vessel" means any vessel propelled by machinery:

(iv) Every power-driven vessel which is under sail and not under power is to be considered a sailing vessel, and every vessel under power, whether under sail or not, is to be considered a power-driven vessel:

(v) A vessel or seaplane on the water is "under way" when she is not at anchor, or made fast to the shore, or aground:

(vi) The term "height above the hull" means height above the uppermost continuous deck:

(vii) The length and breadth of a vessel shall be her length overall and largest breadth:

(viii) The length and span of a seaplane shall be its maximum length and span as shown in its certificate of airworthiness, or as determined by measurement in the absence of such certificate:

(ix) Vessels shall be deemed to be in sight of one another only when one can be observed visually from the other:

(x) The word "visible", when applied to lights, means visible on a dark night with a clear atmosphere:

(xi) The term "short blast" means a blast of about one second's duration:

(xii) The term "prolonged blast" means a blast of from four to six seconds' duration:

(xiii) The word "whistle" means any appliance capable of producing the prescribed short and prolonged blasts:

(xiv) The term "engaged in fishing" means fishing with nets, lines, or trawls; but does not include fishing with trolling lines.

PART B—LIGHTS AND SHAPES

RULE 2

(a) A power-driven vessel when under way shall carry—

(i) On or in front of the foremast, or if a vessel without a foremast then in the forepart of the vessel, a white light so constructed as to show an unbroken light over an arc of the horizon of 225 degrees (20 points of the compass), so fixed as to show the light $112\frac{1}{2}$ degrees (10 points) on each side of the vessel, that is, from right ahead to $22\frac{1}{2}$ degrees (2 points) abaft the beam on either side, and of such a character as to be visible at a distance of at least 5 miles:

(ii) Either forward of or abaft the white light prescribed in subparagraph (i) a second white light similar in construction and character to that light. Vessels of less than 150 ft in length shall not be required to carry this second white light, but may do so:

(iii) These two white lights shall be so placed in a line with and over the keel that one shall be at least 15 ft higher than the other and in such a position that the forward light shall always be shown lower than the after one. The horizontal distance between the two white lights shall be at least three times the vertical distance. The lower of these two white lights or, if only one is carried, then that light, shall be placed at a height above the hull of not less than 20 ft, and, if the breadth of the vessel exceeds 20 ft, then at a height above the hull not less than such breadth, so however that the light need not be placed at a greater height above the hull than 40 ft. In all circumstances the light or lights, as the case may be, shall be so placed as to be clear of and above all other lights and obstructing superstructures:

(iv) On the starboard side a green light so constructed as to show an unbroken light over an arc of the horizon on $112\frac{1}{2}$ degrees (10 points of the compass), so fixed as to show the light from right ahead to $22\frac{1}{2}$ degrees (2 points) abaft the beam on the starboard side, and of such a character as to be visible at a distance of at least 2 miles:

(v) On the port side a red light so constructed as to show an unbroken light over an arc of the horizon of $112\frac{1}{2}$ degrees (10 points of the compass), so fixed as to show the light from right ahead to $22\frac{1}{2}$ degrees (2 points) abaft the beam on the port side, and of such a character as to be visible at a distance of at least 2 miles:

(vi) The said green and red sidelights shall be fitted with inboard screens projecting at least 3 ft forward from the light, so as to prevent these lights from being seen across the bows.

(b) A seaplane under way on the water shall carry—

(i) In the forepart amidships where it can best be seen a white light, so constructed as to show an unbroken light over an arc of the horizon of 220 degrees of the compass, so fixed as to show the light 110 degrees on each side of the seaplane, namely, from right ahead to 20 degrees abaft the beam on either side, and of such a character as to be visible at a distance of at least 3 miles:

(ii) On the right or starboard wing tip a green light, so constructed as to show an unbroken light over an arc of the horizon of 110 degrees of the compass, so fixed as to show the light from right ahead to 20 degrees abaft the beam on the starboard side, and of such a character as to be visible at a distance of at least 2 miles:

(iii) On the left or port wing tip a red light so constructed as to show an unbroken light over an arc of the horizon of 110 degrees of the compass, so fixed as to show the light from right ahead to 20 degrees abaft the beam on the port side, and of such a character as to be visible at a distance of at least 2 miles.

Rule 3

(a) A power-driven vessel when towing or pushing another vessel or seaplane shall, in addition to her sidelights, carry two white lights in a vertical line one over the other, not less than 6 ft apart, and when towing and the length of the tow, measuring from the stern of the towing vessel to the stern of the last vessel towed, exceeds 600 ft, shall carry three white lights in a vertical line one over the other, so that the upper and lower lights shall be the same distance from, and not less than 6 ft above or below, the middle light. Each of these lights shall be of the same construction and character and one of them shall be carried in the same position as the white light prescribed in rule 2 (a) (i). None of these lights shall be carried at a height of less than 14 ft above the hull. In a vessel with a single mast, such lights may be carried on the mast.

(b) The towing vessel shall also show either the stern light prescribed in rule 10 or in lieu of that light a small white light abaft the funnel or aftermast for the tow to steer by, but such light shall not be visible forward of the beam.

(c) Between sunrise and sunset a power-driven vessel engaged in towing, if the length of tow exceeds 600 ft, shall carry, where it can best be seen, a black diamond shape at least 2 ft in diameter.

(d) A sea plane on the water, when towing one or more seaplanes or vessels, shall carry the lights prescribed in rule 2 (b) (i), (ii), and (iii); and, in addition, she shall carry a second white light of the same construction and character as the white light prescribed in rule 2 (b) (i), and in a vertical line at least 6 ft above or below such light.

Rule 4

(a) A vessel which is not under command shall carry, where they can best be seen, and, if a power-driven vessel, in lieu of the lights prescribed in rule 2 (a) (i) and (ii), two red lights in a vertical line one over the other not less than 6 ft apart, and of such a character as to be visible all round the horizon at a distance of at least 2 miles. By day, she shall carry in a vertical line one over the other not less than 6 ft apart, where they can best be seen, two black balls or shapes each not less than 2 ft in diameter.

(b) A seaplane on the water which is not under command may carry, where they can best be seen, and in lieu of the light prescribed in rule 2 (b) (i), two red lights in a vertical line, one over the other, not less than 3 ft apart, and of such a character as to be visible all round the horizon at a distance of at least 2 miles, and may by day carry in a vertical line one over the the other not less than 3 ft apart, where they can best be seen, two black balls or shapes, each not less than 2 ft in diameter.

(c) A vessel engaged in laying or in picking up a submarine cable or navigation mark, or a vessel engaged in surveying or underwater operations, or a vessel engaged in replenishment at sea, or in the launching or recovery of aircraft when from the nature of her work she is unable to get out of the way of approaching vessels, shall carry, in lieu of the lights prescribed in rule 2 (a) (i) and (ii), or rule 7 (a) (i), three lights in a vertical line one over the other so that the upper and lower lights shall be the same distance from, and not less

than 6 ft above or below, the middle light. The highest and lowest of these lights shall be red, and the middle light shall be white, and they shall be of such a character as to be visible all round the horizon at a distance of at least 2 miles. By day, she shall carry in a vertical line one over the other not less than 6 ft apart, where they can best be seen, three shapes each not less than 2 ft in diameter, of which the highest and lowest shall be globular in shape and red in colour, and the middle one diamond in shape and white.

(d) (i) A vessel engaged in minesweeping operations shall carry at the fore truck a green light, and at the end or ends of the fore yard on the side or sides on which danger exists, another such light or lights. These lights shall be carried in addition to the light prescribed in rule 2 (a) (i) or rule 7 (a) (i), as appropriate, and shall be of such a character as to be visible all round the horizon at a distance of at least 2 miles. By day she shall carry black balls, not less than 2 ft in diameter, in the same position as the green lights:

(ii) The showing of these lights or balls indicates that it is dangerous for other vessels to approach closer than 3,000 ft astern of the minesweeper or 1,500 ft on the side or sides on which danger exists.

(e) The vessels and seaplanes referred to in this rule, when not making way through the water, shall show neither the coloured sidelights nor the stern light, but when making way they shall show them.

(f) The lights and shapes prescribed in this rule are to be taken by other vessels and seaplanes as signals that the vessel or seaplane showing them is not under command and cannot therefore get out of the way.

(g) These signals are not signals of vessels in distress and requiring assistance. Such signals are contained in rule 31.

Rule 5

(a) A sailing vessel under way and any vessel or seaplane being towed shall carry the same lights as are prescribed by rule 2 for a power-driven vessel or a seaplane under way, respectively, with the exception of the white lights specified therein, which they shall never carry. They shall also carry stern lights as specified in rule 10, provided that vessels towed, except the last vessel of a tow, may carry, in lieu of such stern light, a small white light as prescribed in rule 3 (b).

(b) In addition to the lights prescribed in paragraph (a), a sailing vessel may carry on the top of the foremast two lights in a vertical line one over the other, sufficiently separated so as to be clearly distinguished. The upper light shall be red and lower light shall be green. Both lights shall be constructed and fixed as prescribed in rule 2 (a) (i) and shall be visible at a distance of at least 2 miles.

(c) A vessel being pushed ahead shall carry, at the forward end, on the starboard side a green light and on the port side a red light, which shall have the same characteristics as the lights prescribed in rule 2 (a) (iv) and (v) and shall be screened as provided in rule 2 (a) (vi), provided that any number of vessels pushed ahead in a group shall be lighted as one vessel.

(d) Between sunrise and sunset a vessel being towed, if the length of the tow exceeds 600 ft, shall carry, where it can best be seen, a black diamond shape at least 2 ft in diameter.

Rule 6

(a) When it is not possible on account of bad weather or other sufficient cause to fix the green and red sidelights, these lights shall be kept at hand lighted and ready for immediate use, and shall, on the approach of or to other vessels, be exhibited on their respective sides in sufficient time to prevent collision, in such manner as to make them most visible, and so that the green light shall not be seen on the port side nor the red light on the starboard side, nor, if practicable more than 22½ degrees (2 points) abaft the beam on their respective sides.

(b) To make the use of these portable lights more certain and easy, the lanterns containing them shall each be painted outside with the colour of the lights they respectively contain, and shall be provided with proper screens.

RULE 7

Power-driven vessels of less than 65 ft in length, vessels under oars or sails of less than 40 ft in length, and rowing boats, when under way shall not be required to carry the lights prescribed in rules 2, 3, and 5, but if they do not carry them they shall be provided with the following lights:

(a) Power-driven vessels of less than 65 ft in length, except as provided in paragraphs (b) and (c), shall carry—

(i) In the forepart of the vessel, where it can best be seen, and at a height above the gunwale of not less than 9 ft, a white light constructed and fixed as prescribed in rule 2 (a) (i) and of such a character as to be visible at a distance of at least 3 miles:

(ii) Green and red sidelights constructed and fixed as prescribed in rule 2 (a) (iv) and (v), and of such a character as to be visible at a distance of at least 1 mile, or a combined lantern showing a green light and a red light from right ahead to 22½ degrees (2 points) abaft the beam on their respective sides. Such lantern shall be carried not less than 3 ft below the white light.

(b) Power-driven vessels of less than 65 ft in length when towing or pushing another vessel shall carry—

(i) In addition to the sidelights or the combined lantern prescribed in paragraph (a) (ii) two white lights in a vertical line, one over the other not less than 4 ft apart. Each of these lights shall be of the same construction and character as the white light prescribed in paragraph (a) (i) and one of them shall be carried in the same position. In a vessel with a single mast such lights may be carried on the mast:

(ii) Either a stern light as prescribed in rule 10 or in lieu of that light a small white light abaft the funnel or aftermast for the tow to steer by, but such light shall not be visible forward of the beam.

(c) Power-driven vessels of less than 40 ft in length may carry the white light at a less height than 9 ft above the gunwale but it shall be carried not less than 3 ft above the sidelights or the combined lantern prescribed in paragraph (a) (ii).

(d) Vessels of less than 40 ft in length, under oars or sails, except as provided in paragraph (f), shall, if they do not carry the sidelights, carry, where it can best be seen, a lantern showing a green light on one side and a red light on the other, of such a character as to be visible at a distance of at least 1 mile, and so fixed that the green light shall not be seen on the port side, nor the red light on the starboard side. Where it is not possible to fix this light, it shall be kept ready for immediate use and shall be exhibited in sufficient time to prevent collision and so that the green light shall not be seen on the port side nor the red light on the starboard side.

(e) The vessels referred to in this rule when being towed shall carry the sidelights or the combined lantern prescribed in paragraph (a) or paragraph (d) of this rule, as appropriate, and a stern light as prescribed in rule 10, or, except the last vessel of the tow, a small white light as prescribed in paragraph (b) (ii). When being pushed ahead they shall carry at the forward end the sidelights or combined lantern prescribed in paragraph (a) or paragraph (d) of this rule, as appropriate, provided that any number of vessels referred to in this rule when pushed ahead in a group shall be lighted as one vessel under this rule unless the overall length of the group exceeds 65 ft when the provisions of rule 5 (c) shall apply.

(f) Small rowing boats, whether under oars or sail, shall only be required to have ready at hand an electric torch or a lighted lantern, showing a white light, which shall be exhibited in sufficient time to prevent collision.

(g) The vessels and boats referred to in this rule shall not be required to carry the lights or shapes prescribed in rules 4 (a) and 11 (e), and the size of their day signals may be less than is prescribed in rules 4 (c) and 11 (c).

Rule 8

(a) A power-driven pilot vessel when engaged on pilotage duty and under way—

(i) Shall carry a white light at the masthead at a height of not less than 20 ft above the hull, visible all round the horizon at a distance of at least 3 miles and at a distance of 8 ft below it a red light similar in construction and character. If such a vessel is of less than 65 ft in length she may carry the white light at a height of not less than 9 ft above the gunwale and the red light at a distance of 4 ft below the white light:

(ii) Shall carry the sidelights or lanterns prescribed in rule 2 (a) (iv) and (v) or rule 7 (a) (ii) or (d), as appropriate, and the stern light prescribed in rule 10:

(iii) Shall show one or more flare-up lights at intervals not exceeding 10 minutes. An intermittent white light visible all round the horizon may be used in lieu of flare-up lights.

(b) A sailing pilot vessel when engaged on pilotage duty and under way—

(i) Shall carry a white light at the masthead visible all round the horizon at a distance of at least 3 miles:

(ii) Shall be provided with the sidelights or lantern prescribed in rule 5 (a) or rule 7 (d), as appropriate, and shall, on the near approach of or to other vessels, have such lights ready for use, and shall show them at short intervals to indicate the direction in which she is heading, but the green light shall not be shown on the port side nor the red light on the starboard side. She shall also carry the stern light prescribed in rule 10:

(iii) Shall show one or more flare-up lights at intervals not exceeding 10 minutes.

(c) A pilot vessel when engaged on pilotage duty and not under way shall carry the lights and show the flares prescribed in paragraph (a) (i) and (iii) or paragraph (b) (i) and (iii), as appropriate, and if at anchor shall also carry the anchor lights prescribed in rule 11.

(d) A pilot vessel when not engaged on pilotage duty shall show the lights or shapes for a similar vessel of her length.

Rule 9

(a) Fishing vessels when not engaged in fishing shall show the lights or shapes for similar vessels of their length.

(b) Vessels engaged in fishing, when under way or at anchor, shall show only the lights and shapes prescribed in this rule, which lights and shapes shall be visible at a distance of at least 2 miles.

(c) (i) Vessels when engaged in trawling, by which is meant the dragging of a dredge net or other apparatus through the water, shall carry two lights in a vertical line, one over the other, not less than 4 ft nor more than 12 ft apart. The upper of these lights shall be green and the lower light white and each shall be visible all round the horizon. The lower of these two lights shall be carried at a height above the sidelights not less than twice the distance between the two vertical lights:

(ii) Such vessels may in addition carry a white light similar in construction to the white light prescribed in rule 2 (a) (i), but such light shall be carried lower than and abaft the all-round green and white lights.

(d) Vessels when engaged in fishing, except vessels engaged in trawling, shall carry the lights prescribed in paragraph (c) (i) except that the upper of the two vertical lights shall be red. Such vessels if of less than 40 ft in length may carry the red light at a height of not less than 9 ft above the gunwale and the white light not less than 3 ft below the red light.

(e) Vessels referred to in paragraphs (c) and (d), when making way through the water, shall carry the sidelights or lanterns prescribed in rule 2 (a) (iv) and (v) or rule 7 (a) (ii) or (d), as appropriate, and the stern light prescribed in rule 10. When not making way through the water they shall show neither the sidelights nor the stern light.

(f) Vessels referred to in paragraph (d) with outlying gear extending more than 500 ft horizontally into the seaway shall carry an additional all-round white light at a horizontal distance of not less than 6 ft nor more than 20 ft away from the vertical lights in the direction of the outlying gear. This additional white light shall be placed at a height not exceeding that of the white light prescribed in paragraph (c) (i) and not lower than the sidelights.

(g) In addition to the lights which they are required by this rule to carry, vessels engaged in fishing may, if necessary in order to attract the attention of an approaching vessel, use a flare-up light, or may direct the beam of their searchlight in the direction of a danger threatening the approaching vessel, in such a way as not to embarrass other vessels. They may also use working lights, but fishermen shall take into account that specially bright or insufficiently screened working lights may impair the visibility and distinctive character of the lights prescribed in this rule.

(h) By day vessels when engaged in fishing shall indicate the occupation by displaying where it can best be seen a black shape consisting of two cones each not less than 2 ft in diameter with their points together one above the other. Such vessels if of less than 65 ft in length may substitute a basket for such black shape. If their outlying gear extends more than 500 ft horizontally into the seaway, vessels engaged in fishing shall display in addition one black conical shape, point upwards in the direction of the outlying gear.

NOTE—Vessels fishing with trolling lines are not "engaged in fishing" as defined in rule 1 (c) (xiv).

RULE 10

(a) Except where otherwise provided in these rules, a vessel when under way shall carry at her stern a white light, so constructed that it shall show an unbroken light over an arc of the horizon of 135 degrees (12 points of the compass), so fixed as to show the light $67\frac{1}{2}$ degrees (6 points) from right aft on each side of the vessel, and of such a character as to be visible at a distance of at least 2 miles.

(b) In a small vessel, if it is not possible on account of bad weather or other sufficient cause for this light to be fixed, an electric torch or a lighted lantern showing a white light shall be kept at hand ready for use and shall, on the approach of an overtaking vessel, be shown in sufficient time to prevent collision.

(c) A seaplane on the water when under way shall carry on her tail a white light, so constructed as to show an unbroken light over an arc of the horizon of 140 degrees of the compass, so fixed as to show the light 70 degrees from right aft on each side of the seaplane, and of such a character as to be visible at a distance of at least 2 miles.

RULE 11

(a) A vessel of less than 150 ft in length, when at anchor, shall carry in the forepart of the vessel, where it can best be seen, a white light visible all round the horizon at a distance of at least 2 miles. Such a vessel may also carry a second white light in the position prescribed in paragraph (b) of this rule but shall not be required to do so. The second white light, if carried, shall be visible at a distance of at least 2 miles and so placed as to be as far as possible visible all round the horizon.

(b) A vessel of 150 ft or more in length, when at anchor, shall carry near the stem of the vessel, at a height of not less than 20 ft above the hull, one such light, and at or near the stern of the vessel and at such a height that it shall be not less than 15 ft lower than the forward light, another such light. Both these lights shall be visible at a distance of at least 3 miles and so placed as to be as far as possible visible all round the horizon.

(c) Between sunrise and sunset every vessel when at anchor shall carry in the forpart of the vessel, where it can best be seen, one black ball not less than 2 ft in diameter.

(d) A vessel engaged in laying or in picking up a submarine cable or navigation mark, or a vessel engaged in surveying or underwater operations, when at anchor, shall carry the lights or shapes prescribed in rule 4 (c) in addition to those prescribed in the appropriate preceding paragraphs of this rule.

(e) A vessel aground shall carry the light or lights prescribed in paragraph (a) or paragraph (b) and the two red lights prescribed in rule 4 (a). By day she shall carry, where they can best be seen three black balls, each not less than 2 ft in diameter, placed in a vertical line one over the other, not less than 6 ft apart.

(f) A seaplane on the water under 150 ft in length, when at anchor, shall carry, where it can best be seen, a white light, visible all round the horizon at a distance of at least 2 miles.

(g) A seaplane on the water 150 ft or upwards in length, when at anchor, shall carry, where they can best be seen, a white light forward and a white light aft, both lights visible all round the horizon at a distance of at least 3 miles; and, in addition, if the seaplane is more than 150 ft in span, a white light on each side to indicate the maximum span, and visible, so far as practicable, all round the horizon at a distance of 1 mile.

(h) A seaplane aground shall carry an anchor light or lights as prescribed in paragraphs (f) and (g), and in addition may carry two red lights in a vertical line, at least 3 ft apart, so placed as to be visible all round the horizon.

Rule 12

Every vessel or seaplane on the water may, if necessary in order to attract attention, in addition to the lights which she is by these rules required to carry, show a flare-up light or use a detonating or other efficient sound signal that cannot be mistaken for any signal authorised elsewhere under these rules.

Rule 13

(a) Nothing in these rulses shall interfere with the operation of any special rules made by the Government of any nation with respect to additional station and signal lights for ships of war, for vessels sailing under convoy, for fishing vessels engaged in fishing as a fleet, or for seaplanes on the water.

(b) Whenever the Government concerned shall have determined that a naval or other military vessel or waterborne seaplane of special construction or purpose cannot comply fully with the provisions of any of these rules with respect to the number, position, range, or arc of visibility of lights or shapes, without interfering with the military function of the vessel or seaplane, such vessel or seaplane shall comply with such other provisions in regard to the number, position, range, or arc of visibility of lights or shapes as her Government shall have determined to be the closest possible compliance with these rules in respect of that vessel or seaplane.

Rule 14

A vessel proceeding under sail, when also being propelled by machinery, shall carry in the daytime forward, where it can best be seen, one black conical shape, point downwards, not less than 2 ft in diameter at its base.

PRELIMINARY

1. The possession of information obtained from radar does not relieve any vessel of the obligation of conforming strictly with the rules and, in particular, the obligations contained in rules 15 and 16.

2. The Annex to the rules contains recommendations intended to assist in the use of radar as an aid to avoiding collision in restricted visibility.

RULE 15

(a) A power-driven vessel of 40 ft or more in length shall be provided with an efficient whistle, sounded by steam or by some substitute for steam, so placed that the sound may not be intercepted by any obstruction, and with an efficient foghorn, to be sounded by mechanical means, and also with an efficient bell. A sailing vessel of 40 ft or more in length shall be provided with a similar foghorn and bell.

(b) All signals prescribed in this rule for vessels under way shall be given—

(i) By power-driven vessels on the whistle:

(ii) By sailing vessels on the foghorn:

(iii) By vessels towed on the whistle or foghorn.

(c) In fog, mist, falling snow, heavy rainstorms, or any other condition similarly restricting visibility, whether by day or night, the signals prescribed in this rule shall be used as follows:

(i) A power-driven vessel making way through the water, shall sound at intervals of not more than two minutes a prolonged blast:

(ii) A power-driven vessel under way, but stopped and making no way through the water, shall sound at intervals of not more than two minutes two prolonged blasts, with an interval of about one second between them:

(iii) A sailing vessel under way shall sound, at intervals of not more than one minute, when on the starboard tack one blast, when on the port tack two blasts in succession, and when with the wind abaft the beam three blasts in succession:

(iv) A vessel when at anchor shall at intervals of not more than one minute ring the bell rapidly for about five seconds. In vessels of more than 350 ft in length the bell shall be sounded in the forepart of the vessel, and in addition there shall be sounded in the after part of the vessel, at intervals of not more than one minute for about five seconds, a gong or other instrument, the tone and sounding of which cannot be confused with that of the bell. Every vessel at anchor may in addition, in accordance with rule 12, sound three blasts in succession, namely, one short, one prolonged, and one short blast, to give warning of her position and of the possibility of collision to an approaching vessel:

(v) A vessel when towing, a vessel engaged in laying or in picking up a submarine cable or navigation mark, and a vessel under way which is unable to get out of the way of an approaching vessel through being not under command or unable to manoeuvre as required by these rules shall, instead of the signals prescribed in subparagraphs (i), (ii), and (iii), sound, at intervals of not more than one minute, three blasts in succession, namely, one prolonged blast followed by two short blasts:

(vi) A vessel towed, or, if more than one vessel is towed, only the last vessel of the tow, if manned, shall at intervals of not more than one minute, sound four blasts in succession, namely, one prolonged blast followed by three short blasts. When practicable, this signal shall be made immediately after the signal made by the towing vessel:

(vii) A vessel aground shall give the bell signal and, if required, the gong signal, prescribed in subparagraph (iv) and shall, in addition, give three separate and distinct strokes on the bell immediately before and after such rapid ringing of the bell:

(viii) A vessel engaged in fishing when under way or at anchor shall at intervals of not more than one minute sound the signal prescribed in subparagraph (v). A vessel when fishing with trolling lines and under way shall sound the signals prescribed in subparagraph (i), subparagraph (ii), or subparagraph (iii) as may be appropriate:

(ix) A vessel of less than 40 ft in length, a rowing boat, or a seaplane on the water, shall not be obliged to give the above-mentioned signals but if she does not, she shall make some other efficient sound signal at intervals of not more than one minute:

(x) A power-driven pilot vessel when engaged on pilotage duty may, in addition to the signals prescribed in subparagraphs (i), (ii), and (iv), sound an identity signal consisting of four short blasts.

Rule 16

(a) Every vessel, or seaplane when taxiing on the water, shall, in fog, mist, falling snow, heavy rainstorms, or any other condition similarly restricting visibility, go at a moderate speed, having careful regard to the existing circumstances and conditions.

(b) A power-driven vessel hearing, apparently forward of her beam, the fog signals of a vessel the position of which is not ascertained, shall, so far as the circumstances of the case admit, stop her engines, and then navigate with caution until danger of collision is over.

(c) A power-driven vessel which detects the presence of another vessel forward of her beam before hearing her fog signal or sighting her visually may take early and substantial action to avoid a close quarters situation but, if this cannot be avoided, she shall, so far as the circumstances of the case admit, stop her engines in proper time to avoid collision and then navigate with caution until danger of collision is over.

PART D—STEERING AND SAILING RULES

Preliminary

1. In obeying and construing these rules, any action taken should be positive, in ample time, and with due regard to the observance of good seamanship.

2. Risk of collision, can when circumstances permit, be ascertained by carefully watching the compass bearing of an approaching vessel. If the bearing does not appreciably change, such risk should be deemed to exist.

3. Mariners should bear in mind that seaplanes in the act of landing or taking off, or operating under adverse weather conditions, may be unable to change their intended action at the last moment.

4. Rules 17 to 24 apply only to vessels in sight of one another.

Rule 17

(a) When two sailing vessels are approaching one another, so as to involve risk of collision, one of them shall keep out of the way of the other as follows:

(i) When each has the wind on a different side, the vessel which has the wind on the port side shall keep out of the way of the other:

(ii) When both have the wind on the same side, the vessel which is to windward shall keep out of the way of the vessel which is to leeward.

(b) For the purposes of this rule the windward side shall be deemed to be the side opposite to that on which the mainsail is carried or, in the case of a square-rigged vessel, the side opposite to that on which the largest fore-and-aft sail is carried.

Rule 18

(a) When two power-driven vessels are meeting end on, or nearly end on, so as to involve risk of collision, each shall alter her course to starboard, so that each may pass on the port side of the other. This rule only applies to cases where vessels are meeting end on, or nearly end on, in such a manner as to involve risk of collision, and does not apply to two vessels which must, if both keep on their respective courses, pass clear of each other. The only cases to which it does apply are when each of two vessels is end on, or nearly end on, to the other; in other words, to cases in which, by day, each vessel sees the masts of the other in a line, or nearly in a line, with her own; and by night, to cases in which each vessel is in such a position as to see both the sidelights of the other. It does not apply, by day, to cases in which a vessel sees another ahead crossing her own course; or, by night, to cases where the red light of one vessel is opposed to the red light of the other or where the green light of one vessel is opposed to the green light of the other or where a red light without a green light or a green light without a red light is seen ahead, or where both green and red lights are seen anywhere but ahead.

(b) For the purposes of this rule and rules 19 to 29 inclusive, except rule 20 (c) and rule 28, a seaplane on the water shall be deemed to be a vessel, and the expression "power-driven vessel" shall be construed accordingly.

Rule 19

When two power-driven vessels are crossing, so as to involve risk of collision, the vessel which has the other on her own starboard side shall keep out of the way of the other.

Rule 20

(a) When a power-driven vessel and a sailing vessel are proceeding in such directions as to involve risk of collision, except as provided for in rules 24 and 26, the power-driven vessel shall keep out of the way of the sailing vessel.

(b) This rule shall not give to a sailing vessel the right to hamper, in a narrow channel, the safe passage of a power-driven vessel which can navigate only inside such channel.

(c) A seaplane on the water shall, in general, keep well clear of all vessels and avoid impeding their navigation. In circumstances, however, where risk of collision exists, she shall comply with these rules.

Rule 21

Where by any of these rules one of two vessels is to keep out of the way, the other shall keep her course and speed. When, from any cause, the latter vessel finds herself so close that collision cannot be avoided by the action of the giving-way vessel alone, she also shall take such action as will best aid to avert collision (see rules 27 and 29).

RULE 22

Every vessel which is directed by these rules to keep out of the way of another vessel shall, so far as possible, take positive early action to comply with this obligation, and shall, if the circumstances of the case admit, avoid crossing ahead of the other.

RULE 23

Every power-driven vessel which is directed by these rules to keep out of the way of another vessel shall, on approaching her, if necessary, slacken her speed or stop or reverse.

RULE 24

(a) Notwithstanding anything contained in these rules, every vessel overtaking any other shall keep out of the way of the overtaken vessel.

(b) Every vessel coming up with another vessel from any direction more than 22½ degrees (2 points) abaft her beam, i.e., in such a position, with reference to the vessel which she is overtaking, that at night she would be unable to see either of that vessel's sidelights, shall be deemed to be an overtaking vessel; and no subsequent alteration of the bearing between the two vessels shall make the overtaking vessel a crossing vessel within the meaning of these rules, or relieve her of the duty of keeping clear of the overtaken vessel until she is finally past and clear.

(c) If the overtaking vessel cannot determine with certainty whether she is forward of or abaft this direction from the other vessel, she shall assume that she is an overtaking vessel and keep out of the way.

RULE 25

(a) In a narrow channel every power-driven vessel when proceeding along the course of the channel shall, when it is safe and practicable, keep to that side of the fairway or mid-channel which lies on the starboard side of such vessel.

(b) Whenever a power-driven vessel is nearing a bend in a channel where a vessel approaching from the other direction cannot be seen, such power-driven vessel, when she shall have arrived within one-half (½) mile of the bend, shall give a signal by one prolonged blast on her whistle which signal shall be answered by a similar blast given by any approaching power-driven vessel that may be within hearing around the bend. Regardless of whether an approaching vessel on the farther side of the bend is heard, such bend shall be rounded with alertness and caution.

(c) In a narrow channel a power-driven vessel of less than 65 ft in length shall not hamper the safe passage of a vessel which can navigate only inside such channel.

RULE 26

All vessels not engaged in fishing (except vessels to which the provisions of rule 4 apply) shall, when under way, keep out of the way of vessels engaged in fishing. This rule shall not give to any vessel engaged in fishing the right of obstructing a fairway used by vessels other than fishing vessels.

RULE 27

In obeying and construing these rules due regard shall be had to all dangers of navigation and collision, and to any special circumstances, including the limitations of the craft involved, which may render a departure from the above rules necessary in order to avoid immediate danger.

PART E—SOUND SIGNALS FOR VESSELS IN SIGHT OF ONE ANOTHER

RULE 28

(a) When vessels are in sight of one another, a power-driven vessel under way, in taking any course authorised or required by these rules, shall indicate that course by the following signals on her whistle, namely:

One short blast to mean "I am altering my course to starboard":

Two short blasts to mean "I am altering my course to port":

Three short blasts to mean "My engines are going astern".

(b) Whenever a power-driven vessel which, under these rules, is to keep her course and speed, is in sight of another vessel and is in doubt whether sufficient action is being taken by the other vessel to avert collision, she may indicate such doubt by giving at least five short and rapid blasts on the whistle. The giving of such a signal shall not relieve a vessel of her obligations under rules 27 and 29 or any other rule, or of her duty to indicate any action taken under these rules by giving the appropriate sound signals laid down in this rule.

(c) Any whistle signal mentioned in this rule may be further indicated by a visual signal consisting of a white light visible all round the horizon at a distance of at least 5 miles, and so devised that it will operate simultaneously and in conjunction with the whistle-sounding mechanism and remain lighted and visible during the same period as the sound signal.

(d) Nothing in these rules shall interfere with the operation of any special rules made by the Government of any nation with respect to the use of additional whistle signals between ships of war or vessels sailing under convoy.

PART F—MISCELLANEOUS

RULE 29

Nothing in these rules shall exonerate any vessel, or the owner, master or crew thereof, from the consequences of any neglect to carry lights or signals, or of any neglect to keep a proper lookout, or of the neglect of any precaution which may be required by the ordinary practice of seamen, or by the special circumstances of the case.

RULE 30

Reservation of Rules for Harbours and Inland Navigation

Nothing in these rules shall interfere with the operation of a special rule duly made by local authority relative to the navigation of any harbour, river, lake, or inland water, including a reserved seaplane area.

RULE 31

Distress Signals

(a) When a vessel or seaplane on the water is in distress and requires assistance from other vessels or from the shore, the following shall be the signals to be used or displayed by her, either together or separately, namely:

(i) A gun or other explosive signal fired at intervals of about a minute:

(ii) A continuous sounding with any fog-signalling apparatus:

(iii) Rockets or shells, throwing red stars fired one at a time at short intervals:

(iv) A signal made by radiotelegraphy or by any other signalling method consisting of the group · · · — — — · · · in the Morse Code:

(v) A signal sent by radiotelephony consisting of the spoken word "Mayday":

(vi) The International Code Signal of distress indicated by N.C.:

(vii) A signal consisting of a square flag having above or below it a ball or anything resembling a ball:

(viii) Flames on the vessel (as from a burning tar barrel, oil barrel, etc.):

(ix) A rocket parachute flare or hand flare showing a red light:

(x) A smoke signal giving off a volume of orange-coloured smoke:

(xi) Slowly and repeatedly raising and lowering arms outstretched to each side.

NOTE—Vessels in distress may use the radiotelegraph alarm signal or the radiotelephone alarm signal to secure attention to distress calls and messages. The radiotelegraph alarm signal, which is designed to actuate the radiotelegraph auto alarms of vessels so fitted, consists of a series of 12 dashes, sent in one minute, the duration of each dash being four seconds, and the duration of the interval between two consecutive dashes being one second. The radiotelephone alarm signal consists of two tones transmitted alternately over periods of from 30 seconds to one minute.

(b) The use of any of the foregoing signals, except for the purpose of indicating that a vessel or a seaplane is in distress, and the use of any signals which may be confused with any of the above signals, is prohibited.

ANNEX TO THE RULES

RECOMMENDATIONS ON THE USE OF RADAR INFORMATION AS AN AID TO AVOIDING COLLISIONS AT SEA

(1) Assumptions made on scanty information may be dangerous and should be avoided.

(2) A vessel navigating with the aid of radar in restricted visibility must, in compliance with rule 16 (a), go at a moderate speed. Information obtained from the use of radar is one of the circumstances to be taken into account when determining moderate speed. In this regard it must be recognised that small vessels, small icebergs, and similar floating objects may not be detected by radar. Radar indications of one or more vessels in the vicinity may mean that "moderate speed" should be slower than a mariner without radar might consider moderate in the circumstances.

(3) When navigating in restricted visibility the radar range and bearing alone do not constitute ascertainment of the position of the other vessel under rule 16 (b) sufficiently to relieve a vessel of the duty to stop her engines and navigate with caution when a fog signal is heard forward of the beam.

(4) When action has been taken under rule 16 (c) to avoid a close-quarters situation, it is essential to make sure that such action is having the desired effect. Alterations of course or speed or both are matters as to which the mariner must be guided by the circumstances of the case.

(5) Alteration of course alone may be the most effective action to avoid close quarters, provided that—

(a) There is sufficient sea room:

(b) It is made in good time:

(c) It is substantial. A succession of small alterations of course should be avoided:

(d) It does not result in a close-quarters situation with other vessels.

(6) The direction of an alteration of course is a matter in which the mariner must be guided by the circumstances of the case. An alteration to starboard, particularly when vessels are approaching apparently on opposite or nearly opposite courses, is generally preferable to an alteration to port.

(7) An alteration of speed, either alone or in conjunction with an alteration of course, should be substantial. A number of small alterations of speed should be avoided.

(8) If a close-quarters situation is imminent, the most prudent action may be to take all way off the vessel.

SECOND SCHEDULE

FOREIGN COUNTRIES TO WHOSE SHIPS AND SEAPLANES THE COLLISION REGULATIONS APPLY

Belgium
Burma
Cameroun
Denmark
Finland
France
Greece
Israel
Japan
Liberia
Madagascar
Netherlands
Norway
Paraguay
Peru
Philippines
Poland
Portugal
Roumania
Spain
Sweden
Union of Soviet Socialist Republics
United Arab Republic
United States of America
Vietnam (Republic of)
Yugoslavia.

T. J. SHERRARD,
Clerk of the Executive Council.

13927—66 D

A. R. SHEARER,
GOVERNMENT PRINTER,
WELLINGTON, NEW ZEALAND